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SPORADIC MENINGOCOCCÆMIA AMONG ROYAL AUSTRALIAN NAVAL PERSONNEL.

By J. KEMPSON MADDOX,
Surgeon Lieutenant Commander, Royal Australian Naval Reserve.

CLOSE concentration of service men in camps, barracks and mess decks during this war, as in the last, has fostered the appearance and spread of droplet-borne infection, such as upper respiratory tract infections, meningococcal infections, infectious mononucleosis, infective hepatitis, acute exanthemata and the like. Before clinical cases develop, it is probable that in many of these diseases a carrier epidemic has preselected any susceptibles. To many such infections, including the meningococcal, a high degree of acquired resistance is probable before adult life. None the less, organisms of high virulence can overcome this resistance at epidemic periods, and in the country lad the resistance to organisms of average virulence may be low or only semi-developed. A complete range of clinical resultants becomes possible, varying, for instance, from fulminating forms of meningococcal fever, in which highly virulent organisms kill even before they localize themselves, to a chronic type of meningococœmia which persists for months or even years as a seemingly benign bacteriemia, producing little more than debility and a skin rash. Frequently the skin rash is unnoticed, so that service returns of "pyrexia of unknown origin", "influenza", "clinical malaria" may include instances of meningococcal infection. It is significant that at a small naval hospital with an average of 50 occupied beds three instances of this type of infection should occur in four months. These patients were all from separate small seagoing ships, in which men are very closely congregated, and there were no indications of a meningitis epidemic in the service or among civilians ashore. These men were

ashore in a capital city every two to four weeks, so that no inference could be drawn as to the duration of the incubation period involved.

Clinical Reports.

CASE I.—H.D.B., an able seaman, aged twenty-one years, reported to the medical officer of a destroyer on September 20, 1943, that he had just had an attack of "influenza", and now some swelling had appeared about his ankles and wrists. The ankles, thighs and elbows were stiff and tender to palpation. A scattered rash consisting of macules 1.0 to 2.0 centimetres in diameter with petechial centres was observed about the buttocks, lower thirds of both legs and malleolar regions. Otherwise the report from his ship stated that he felt well, was afebrile, had no cardiac or respiratory symptoms, and a normal urine. On the day before admission to hospital, he experienced some gripping abdominal pain, and passed loose bloodless stools. He was admitted to "Canonbury" Naval Hospital, Sydney, on September 27, 1943. He looked rather ill (temperature 100° F., pulse rate 90, respirations 20 in the minute), and was pallid, with marked facial *acne vulgaris*. A maculo-papular rash with petechial spots in the centre of each lesion was observed over the malleoli of both ankles. The ankles, though puffy, were not oedematous, nor the joints distended by effusion. The inguinal glands, especially on the left side, were slightly enlarged, but remained discrete and painless to the touch. Clinically these were the only departures from normal in all bodily systems. The rash was considered by me to be probably a drug rash, perhaps from iodides in a cough mixture taken during the "influenza". He was kept in bed, and after two days, the swelling on the backs of his hands and around his ankles had disappeared and no fresh skin lesions were to be seen. A "patch" test for iodide sensitivity gave a negative result. Three days later, colicky abdominal pain recurred, without vomiting, but accompanied by some frequency of micturition, not diarrhoea. The temperature, which varied daily between 97.6° and 99.8° F., was rising a little higher each day. The urine contained an occasional red blood cell, two granular casts and a little albumin, but no leucocytes nor bacteria. His tongue was very furred, but there was no sign of tonsillitis or pharyngitis. Blood pres-

sure registered, systolic, 170 millimetres, and, diastolic, 100 millimetres of mercury. A blood cell count produced the following results:

| | |
|---------------------------------------|-----------|
| Red cells per cubic millimetre | 4,660,000 |
| Hæmoglobin value (Sahli) | 82% |
| Leucocytes per cubic millimetre | 15,500 |
| Neutrophile cells | 61% |
| Lymphocytes | 30% |
| Monocytes | 6% |
| Eosinophile cells | 2% |

Next day (September 4, 1943), although no further rash nor œdema had appeared, he complained bitterly of pains in the neck, arm muscles, loins and legs. There was no increase in the sensitivity of his kidneys to palpation, but his testes were distinctly tender. Rectal examination and a "two glass" test gave equally negative results when a search was made for evidence of prostatic infection.

Three days later (September 7, 1943) he was still febrile, the fastigium now reaching 101° F. Albuminuria was now only a trace, and the blood urea content was nine milligrammes per centum. From the urine a contaminant culture of staphylococcus only was grown. Neither the Wassermann nor the Kline test produced a reaction when applied to the blood. Radiological examination of heart and lungs had failed to reveal any abnormality, and an electrocardiogram was normal in all respects. About three red cells per high diameter field were still visible on examination of the centrifuged urine on October 18, 1943. By this time, with fresh macules appearing about the hands and feet every few days, a diagnostic impasse was reached, and sulphapyridine therapy was commenced "in the dark", always a regrettable decision. An initial dose of two grammes followed by one gramme every four hours was given. A week later, with the patient still subfebrile but in good general condition, a blood culture was attempted in nutrient broth, after the addition of "Procaine" to neutralize the sulphonamide. No culture was obtained even after a week's incubation. Neutrophile leucocytosis continued, and no further indications of renal irritation were observed until a total of 57 grammes of sulphapyridine had been administered in thirteen days. By this time (September 20, 1943) albuminuria had disappeared, the temperature had gradually sunk to normal, and remained so until the rating's discharge from hospital on November 8, 1943. Results of complement deviation tests for gonococcal infection, and of agglutination tests for *Brucella abortus* had been returned as negative, and no rash had been seen for sixteen days. The man was recorded as having had "pyrexia of unknown origin" with transient renal damage.

It was not until the nature of Case II and Case III had become known that in retrospect the diagnosis was changed to one of probable benign meningococœmia. The rash was identical with that of Case III, in which the blood culture was positive. The mode of onset, muscular pains, filthy tongue, preservation of good condition, and response to sulphapyridine were all typical. Testicular or epididymal pain has been described by Appelbaum. Owing to the belated recognition of the nature of this case, no cultures from the naso-pharynx were attempted.

CASE II.—F.E.H., a stoker, aged twenty-five years, was admitted to hospital on January 23, 1944, from a corvette, on which he had been serving for eighteen months, suffering from swelling of the ankles. He stated that swelling of the ankles had been present on and off for six months. He had lost twenty-one pounds in weight. His ankles ached, but he had had no severe pain nor weakness of the feet. There was no history of sore throat or gums, nor of bruising of the skin. For almost three months prior to his admission to hospital he often experienced "chilly feelings" in the afternoon, followed by sweating at night. To direct inquiry he stated that his upper arms had been sore, and that purplish lumps which left behind a brownish stain had been present over his shins. He had not recognized any actual skin rash. His appetite had not been satisfactory and he experienced considerable lassitude, but this had been variable, so that he had never been off duty. He had consulted various medical officers; had been told he was "anæmic", "suffered from a deficiency disease", "rheumatism of ankles" et cetera. His previous health had been faultless. He had had no known contact with any sufferer from meningitis ashore or afloat.

General inspection confirmed considerable weight loss, and the patient's complexion was of a distinctly sallow colour, although his mucous membranes were fairly well coloured. At first, he was considered to be probably suffering from a degree of vitamin deficiency, and his temperature on

admission (100° F.) was ascribed to a head cold of which he then complained. In four days his temperature was normal and his coryza had disappeared. He stated that he felt much improved. He was receiving a full diet high in vitamins, and a mixture containing drachm doses of citrated iron per dose. A blood count at this stage produced the following figures: red cells 4,700,000 per cubic millimetre, and white cells 7,800 per cubic millimetre, in normal proportions. No malarial parasites were seen in the film. The blood sedimented to 34 millimetres at the end of the second hour.

Eight days after his admission, January 31, 1944, his temperature began to rise irregularly again to a fastigium between 101° F. and 102° F. without any obvious cause, and he complained of pain in his left arm and right knee. A radiogram of his chest revealed healthy appearances, and the urine was found to be normal in all respects, even on incubation. His tongue was covered by a heavy brownish yellow fur. His stomach contents were very mucoid, offensive and devoid of free acid. A smear stained by Gram's method revealed a variety of organisms, including some Gram-negative extracellular diplococci which were not further investigated at the time. On February 10, 1944, a few scattered pink macules which were insensitive and non-purpuric were observed about his abdomen. They measured approximately 0.75 by 0.5 centimetre and were felt to be slightly elevated. This discovery raised the question of infection by one of the typhoid group of organisms, but serial Widal tests revealed no progressive rise in titre, and no such organisms could be discovered in stool or urine. During the week February 7 to 14, 1944, the temperature followed a daily remittent pattern, varying from 98° to 104° F., and accompanied by sweating, more pain in knees and elbows, some puffiness of right radio-humeral joint, and a crop of nodules on the shins, about 2.0 centimetres in diameter, resembling *erythema nodosum*. A few of these showed a petechial centre about the size of a pin's head. A further blood count at this stage revealed red cells to number 5,200,000 per cubic millimetre, and leucocytes 12,650 per cubic millimetre, of which neutrophile cells provided 77%. A complement deviation test for gonorrhœa gave a negative result, likewise the Paul-Bunnell test for glandular fever, and the patient's serum failed to agglutinate *Brucella abortus*. By February 21, 1944, a month after his admission to hospital, his temperature had subsided to a daily rise of 99° F., although a few fresh macules continued to appear about the shoulders and legs. He felt much better and ate well, but remained in this subfebrile condition for a fortnight. About this period, another example of chronic meningococœmia had been recognized in the hospital, and the true nature of the patient's illness began to be suspected. Incubation of a post-nasal swab was negative for meningococci, and a specimen of blood was obtained for examination by culture methods, but the temperature at this very point decided to remain normal for twelve days, and the result was negative even after 72 hours' incubation in serum-enriched broth. The leucocytes had fallen again to 9,300 per cubic millimetre. Sulphonamides were still withheld. After this afebrile period of twelve days, during which no rash, joint pains, sign of endocarditis, nephritis or other components of the syndrome could be detected, and during which the rating felt quite well, fever to 101° F. reappeared for three days, together with a few fresh macules, one of which was excised from the shoulder for biopsy and incubation. No meningococci were recovered in a culture from the tissue. A paraffin section stained with hæmatoxylin and eosin showed perivascular infiltration in the corium with polymorphonuclear and mononuclear leucocytes. In Gram-stained sections no intracellular organisms were seen which could not be positively identified. A further specimen of blood was obtained at this stage, from which diplococci were cultured giving the typical reactions of meningococci. Unfortunately no type suspensions were available in Sydney by which to classify the organisms more exactly, or to perform complement deviation tests.

It was not felt justifiable to withhold sulphonamides any longer, so an initial dose of three grammes of sulphadiazine was administered, followed by one gramme every four hours, until a total of 56 grammes had been given. This course resulted characteristically in complete and permanent recovery.

CASE III.—W.S.H., an able bodied seaman, aged twenty-three years, was admitted to "Canonbury" Naval Hospital on March 1, 1944, from a mine sweeper. He stated that he had had a "touch of flu" at sea four days previously, and that he had tried to "sweat it out" with "A.P.C." powders, but had not taken any other drug. He had experienced a severe frontal headache, but no stiffness of the neck. His

bitterest complaints were of severe pains in the legs, neck and back. He had felt no symptoms of upper respiratory infection. Two days previously he had noticed tender lumps appearing in the skin of his limbs. Previously his health was excellent. He knew of no case of illness resembling meningitis with which he had been in contact. He looked rather poisoned, his tongue was heavily furred, his weight was one hundred and forty-one pounds. Physical examination revealed no abnormality except for some tenderness of calf muscles and the presence of a few scattered palpable pink macules on the trunk, and tender raised erythematous areas with hemorrhagic centres over the right ulnar styloid process and left medial malleolus. The right axillary gland was enlarged, soft and not tender. His temperature on admission (March 1, 1944) was 102° F., his pulse rate was 104 per minute. One comment of a medical officer, just arrived from an area where dengue was current, stated that in his opinion the man suffered from dengue, notwithstanding he had been taken ill at sea. A leucocyte count, performed on the day of entry to hospital, revealed a total of 14,500 white cells per cubic millimetre, made up of polymorphonuclear cells 76%, lymphocytes 18%, monocytes 5% and eosinophil cells 1%. A blood film was negative for malaria. Chemical and microscopic examination of the urine revealed no abnormalities. The body temperature fell to normal for forty-eight hours, and then rose steeply to 103° F. for twelve hours, after which it remained normal again for forty-eight hours, when the cycle was repeated. This intermittent fever was superficially (not strictly) quartan in type, and was very striking in its appearance on the record. The rises were unaccompanied by chills or post-febrile sweating, but during the pyrexial episode the patient complained of fresh headache and generalized muscle pains. Two of the fastigia were accompanied by fresh outcrops of tender pink macules two to three centimetres in diameter over the subcutaneous surfaces of the tibiae and malleoli. Some of these lesions showed rounded purpuric centres. Others appeared about the ulnar borders of the forearm and two at the root of the nose. Between the paroxysms of fever, the lad declared he felt very well, and ate accordingly. None the less considerable wasting showed itself after a fortnight, particularly in the calf muscles, which were at times acutely tender. In spite of the adverse information from blood examination and leucocytosis, and as the diagnosis was at this stage not realized, and because of the unusual appearance of the temperature chart, quinine sulphate, in doses of ten grains thrice daily, was administered without avail. A Paul-Bunnell test and an agglutination test for the Brucella group both gave negative results. Leucocytes had now risen to 20,250 per cubic millimetre, and blood was taken for incubation in nutrient broth. This culture was negative after four days' incubation. From a second specimen of blood obtained four days later, at the height of a pyrexial phase, large Gram-negative organisms were grown after forty-eight hours' incubation. Subculture in serum agar produced an organism morphologically identical with the meningococcus.

This culture was forwarded to Honorary Surgeon Commander C. Shearman for chemical identification, who confirmed the organism as a meningococcus. No facilities were available in Sydney at this time to identify further the organism.

Treatment was begun at once with sulphathiazole, three grammes, followed by one gramme every four hours until a total of 70 grammes had been administered in eleven days. At the commencement of this therapy, the temperature was 101.8° F. This fell to normal in six hours, and thereafter never rose higher than 98.8° F. Leucocytes at the conclusion of the sulphonamide course numbered 7,450 per cubic millimetre. The red spots faded to brown and never recurred. The muscles quickly lost their sensitivity, and in two days the sufferer felt entirely well and was anxious to get up.

The following report upon the serological reactions encountered in the last two cases has been furnished by Honorary Surgeon Commander Shearman:

The serum from each patient showed complete fixation of complement in the complement deviation test with an emulsion of the respective organisms isolated from each used as antigen.

The reactions were much stronger in the case of F.E.H. where complete fixation occurred up to a dilution of "1 in 40" of his serum and partial fixation up to a dilution of "1 in 100".

With W.S.G.'s serum, complete fixation occurred with a "1 in 5" dilution of his serum, but with a dilution of "1 in 20", the reaction had almost disappeared.

F.E.H.'s serum ("1 in 5" dilution) also showed almost complete fixation of complement with an emulsion of W.S.G.'s organisms as antigen, but no cross fixation occurred with W.S.G.'s serum, when F.E.H.'s organisms were used as antigen. Unfortunately no stock type culture of meningococcus was available to demonstrate any fixation of complement with this as antigen. Neither serum showed any fixation of complement when an emulsion of *Neisseria gonorrhoea* was used as antigen.

Discussion.

Prior to the onset of the present war, the existence of subacute and chronic meningococcaemia in the pre-meningitis or post-meningitis stages, while well known, was considered a clinical rarity. Thus the records of the Royal Prince Alfred Hospital, Sydney, contain histories of only five cases since 1910, including that reported by Lambie.

Comprehensive clinical descriptions of this condition in civilians were given by Rolleston (1919), who stated that at that time a correct diagnosis was seldom made in the absence of meningeal symptoms. Stewart Wallace described three cases in 1936, and one of the patients died of meningitis after ten months of meningococcaemia. His description has had little added to it since. He stressed the importance of the neutrophile leucocytosis, the characteristic eruption, the quartan type of fever, the muscular hyperaesthesia and the capacity for spontaneous resolution. He emphasized that failure to recover the organisms in blood culture should not be allowed to exclude the diagnosis which could be confidently made on the clinical findings specified above. Three more cases were added in this year by Carbonell and Campbell to a total of 33 reports already contributed to American literature. The patients were three soldiers, two of whom developed meningitis and recovered. These authors reviewed the histories of the 33 American patients, 30 of whom displayed the typical skin lesions. Thirty patients received from 30 to 500 cubic centimetres of anti-meningococcal serum, mostly with "prompt benefit". Carbonell and Campbell emphasized the fact that the absence of jaundice, anaemia, marked toxæmia, splenomegaly and bradycardia was the rule, and actually this absence was of diagnostic assistance. They stated that meningococcus types II and IV were the usual organisms isolated and that these were usually of lower virulence than type I and type III. In a description of the condition in 1937, and of the ease with which it can be overlooked, Appelbaum refers to the occurrence of endocarditis, nephritis and epididymitis as "not uncommon" complications. He further makes the statement that there is no danger of lumbar puncture initiating a meningeal localization of the infection.

The first report in Australian literature was made by Lambie in 1936; it concerned a young woman showing classical clinical features who recovered spontaneously after 29 days' illness. The clinical organism, a type II meningococcus, recovered from both blood and nasopharynx, grew vigorously on ordinary agar, and even survived a journey to England. Meningococcaemia of the subacute and chronic types, with and without epidemic meningitis, has been referred to more frequently in Empire medical literature since the present war began, together with accounts of the dramatic success of sulphonamide therapy. Stott and Copeman recognized 27 instances of the condition during an epidemic among British Expeditionary Force troops in France in the leisure year 1940. They describe bedside diagnosis as "simple", and only three of seventeen cases were proven by blood culture. Moss encountered cases among Australian troops in 1940-1941, and added a further diagnostic criterion: the prompt (twenty-four hour) response to sulphonamide. Hutson in 1942 successfully treated six Australian soldiers suffering from the sporadic type with relatively small doses of sulphapyridine. Positive blood cultures were obtained in half his cases.

There must have been many other cases in the services, and obviously service medical officers should be on the watch for this disease. The clinical combination of a pyrexia, especially when intermittent, with neutrophile leucocytosis, the characteristic rose pink macules with

hemorrhagic centres becoming localized especially about the malleoli in crops accompanying febrile phases, tender muscles or joints, and preservation of fair general condition and red cell concentration, make a definite symptom complex warranting the confident diagnosis of meningococcaemia, and calling for sulphonamide therapy, even in the absence of a positive blood culture. One feature of all three cases described was a particularly "dirty" tongue. Rheumatic fever, malaria, sandfly fever, drug therapy, insect bites, subacute bacterial endocarditis, *erythema nodosum* and *multiforme*, Brucella infections, and typhoid-paratyphoid infections are excluded by one or more of the above criteria. One condition which may give rise to temporary doubt is sporadic dengue, but the nature of the rash, the leucocyte count and the shorter course assist in forming a conclusion. Post-nasal swabbing is sometimes of diagnostic value. According to Mitchell-Higgs, who has given the best description of the cutaneous manifestations including their histology, a complement deviation test for meningococcal infection is preferable to agglutination tests, especially in service personnel, in regard to whom cross-agglutination with gonococcal suspensions may give rise to confusion. He deprecates "shot in the dark" sulphonamide therapy, as this frequently interferes with diagnosis. This may be so, providing, however, that laboratory facilities are available for full investigation. In my opinion, sulphonamide, either sulphapyridine, sulphathiazole or sulphadiazine, all of which have been found equally efficacious in arresting meningococcaemia, should be given promptly, as soon as the clinical diagnosis has been made, as meningitis may develop at any moment. I do not agree with Hutson that small doses, though sufficient, are desirable, and would recommend approximately 60 grammes of the drug chosen, commencing with two grammes and continuing with one gramme every four hours, controlled by leucocyte counts every two days. There is little point in isolating the patient at this stage. Sulphadiazine nasal drops may perhaps be instilled twice daily. Antimeningococcal serum is now never required.

Prognosis today is thus excellent. It was good even in the pre-sulphonamide era, and even in the presence of complications (75% recoveries). Spontaneous recovery is probably the usual rule. Nevertheless, even when such a happy termination seems to have occurred a course of sulphonamide therapy should be given, as the disease may be in a phase of remission, and may return even weeks later. Even the leucocytosis may disappear in such an interval.

The most serious complication is localization in the meninges. Surely it is a most amazing phenomenon that an organism which ordinarily has such a high degree of tissue selectivity, should flood the blood stream for weeks and usually never cause any signs of active meningitis. Rare complications, exhibited in the cases under review, are epididymitis, acute testicular pain (not orchitis), and focal nephritis. These are probably embolic in origin, as may be the acutely tender areas of somatic muscle and even the rash itself.

Such developments make the diagnosis from bacterial endocarditis more difficult, but cardiac enlargement with rough valvular murmurs, clubbing of fingers, purpura and anaemia are points of difference. Actually meningococcal endocarditis itself may follow meningococcaemia. Splenomegaly and enlargement of lymph glands (Case I) are rarely seen in meningococcal infections. The attacks of abdominal pain and diarrhoea in Case I may have been due to sudden bacterial emboli in the bowel wall. No emboli have been described in the retinal arteries.

The object of this communication is to draw attention to a disease whose appearance is favoured by service conditions, especially in the mess decks of His Majesty's ships, but which has hitherto not been so described—an eminently successful disease to treat, but which, if unrecognized, may seriously threaten the lives of the patient and his associates.

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LIVER NECROSIS IN BURNS TREATED WITH TANNIC ACID.

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THE tannic acid treatment of burns was introduced by Davidson⁽¹⁾ in 1925. It rapidly became established as a life-saving procedure, and in 1938 Wilson⁽²⁾ stated that "it may be accepted that the coagulation method is still the method of choice . . . It has effected a considerable reduction in mortality. On this account we felt that the use of control cases in which tannic acid was omitted would have been unjustifiable." Such was orthodox surgical opinion at the outbreak of war. Since then, however, the tannic acid method has been criticized from several points of view. It appears to be unsuitable for certain areas, such as the face and hands, because the rigid eschar is sometimes followed by ischaemia. Also trouble is sometimes caused by sepsis hidden under the tan. Of even more serious import is the suggestion, first made in 1942 by Wells, Humphrey and Coll,⁽³⁾ that tannic acid may cause liver necrosis. They, and other later workers,⁽⁴⁾⁽⁵⁾⁽⁶⁾⁽⁷⁾ have shown that liver necrosis may be produced in rats, mice, guinea-pigs, goats and rabbits by tannic acid injected intravenously or subcutaneously or applied to experimentally burnt skin. In control animals burnt but not treated with tannic acid, little or no liver necrosis occurs. However, the liver damage is most constant and most pronounced when the tannic acid is injected. Simple application of tannic acid to the surface of an experimental burn in a guinea-pig produces "slight liver damage only".⁽⁸⁾ In any case, the results of animal experimentation are not necessarily applicable to human surgery.

Pronounced central hepatic necrosis is frequently seen in humans dying as a result of extensive superficial burns. This was first emphasized by Wilson and his co-workers⁽²⁾ in 1938, and the histo-pathological findings were described in detail by Belt.⁽⁹⁾ Later reports by Wells *et alii*⁽³⁾ and by Erb *et alii*⁽¹⁰⁾ confirmed these observations. All the patients mentioned in these reports had been treated with tannic acid, and in view of the results of experimental work on animals it seems quite likely that the hepatic necrosis is caused by the tannic acid. However, it may be due directly to the burn itself. Does hepatic necrosis occur in patients whose burns are not treated with tannic acid? Accounts of autopsies on patients dying from burns before 1925—that is, prior to the introduction of the tannic acid treatment—make only occasional reference to the

liver. Bardeen⁽¹⁰⁾ in 1897 reported on the post-mortem findings in five children who died from burns, and stated briefly that "the liver showed cloudy swelling". Weiskotten⁽¹¹⁾ in 1919 found "foci of necrosis of liver cells" in two out of ten patients who had died from burns. Park,⁽¹²⁾ summarizing the literature up to the end of the pre-tannic acid era, states that, though "hyperæmia, focal necrosis and parenchymatous degenerative lesions" may sometimes be found in the liver, there are "no characteristic visceral lesions in burns". In these articles^{(10), (11), (12)} full histological descriptions and photomicrographs are not given, but it seems definite that, prior to 1925, such changes as were observed in the liver were not common and never very pronounced. In 1943 Erb⁽⁹⁾ reported the autopsy findings in 61 cases of fatal burns. Nineteen of these subjects were not treated with tannic acid, and in none of the 19 was liver necrosis found. The report was a review of all deaths due to burns occurring in the author's experience during the preceding twenty-three years, and apparently most of the 19 cases occurred prior to 1925.

It appears, then, that pronounced liver necrosis is common in patients who die from burns treated with tannic acid, and is slight in or absent from those not so treated. However, the two groups—the tannic acid group and the non-tannic acid group—are not quite comparable. Nearly all the patients not treated with tannic acid died before 1925, so that not only did they not have tannic acid treatment, but they also did not have the benefit of modern ideas regarding the importance of hæmo-concentration in burns and its control by intravenous serum therapy, nor were modern chemotherapeutic agents for the control of sepsis available. Consequently the older patients frequently died in the first three days from serum loss or after the eleventh day from sepsis. Thus Bardeen's⁽¹⁰⁾ five patients all died in less than ten hours. Only three out of Weiskotten's⁽¹¹⁾ ten patients died between the third and eleventh days. Of the nineteen patients not treated by tannic acid reported by Erb and his co-workers,⁽⁹⁾ only five died between the third and eleventh days. By comparison, 23 out of 25 of the patients treated by tannic acid in Erb's series died between these limits. Only slight liver necrosis was observed in the remaining two patients treated by tannic acid who died outside these limits. Similarly, Wilson *et alii*, in their series of patients treated by tannic acid, found necrosis of any consequence only in those who died between the third and eleventh days.

In spite of the accumulating evidence to the contrary, therefore, it still remains a possibility that the failure to observe liver necrosis in patients who were not treated with tannic acid may be due to the fact that most of these patients die (i) before liver necrosis (caused, for sake of argument, by some hypothetical burns "toxin" and not by tannic acid) had time to develop, or (ii) later, from septic infection of a burn not sufficiently large to cause

much toxæmia, or (iii) perhaps after liver repair had been effected.

The need of further evidence of the toxicity of tannic acid in humans prompted the recording of the following eight cases. In the latter six months of 1943 I performed post-mortem examinations on eight soldiers who died from burns at an Australian general hospital in New Guinea. All burns were first-degree flash burns. The same attempts to stabilize the blood volume by intravenous therapy were made in all cases, and all patients (except one) died between the third and eleventh days. The cases were therefore comparable, except for the local treatment of the burns; some patients were treated by tannic acid and some were not. The results are summarized in Table I.

Only slight liver damage was observed in the four patients who had no coagulant applied to their burns. Similar slight damage was seen in one patient whose burns were treated with silver nitrate. One patient had tannic acid alone applied to his burns; in his liver cloudy swelling was the only abnormality found, and he died later than any of the others from a secondary pulmonary infection. Two patients were treated with a mixture of 10% tannic acid solution and 10% silver nitrate solution; at autopsy pronounced hepatic necrosis was found in both. The necrosis affected almost the whole of each lobule, leaving only a little normal-looking liver tissue in the vicinity of the portal tracts. The difference between these two livers and the other six was very striking. One realizes that no definite conclusions can be drawn from these findings. On the evidence one is as justified in blaming the silver nitrate as the tannic acid for the hepatic necrosis. However, the livers of the two patients treated with tannic acid and silver nitrate were so strikingly different from the comparatively normal livers of those treated otherwise that it was thought advisable to put these observations on record.

Summary.

1. The literature concerning hepatic necrosis in burns treated with tannic acid is reviewed.

2. The livers of eight patients dying from burns were examined. In two, from patients treated with tannic acid and silver nitrate, extensive hepatic necrosis was found. In those from patients whose burns were not treated by tanning, cloudy swelling was the only abnormality found.

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TABLE I.

| Patient. | Survival Time. (Days.) | Cause of Burn. | Fraction of Body Surface Burned. | Anæsthetic Agent. | Coagulant Used. | Liver Pathology. | Complications. |
|-------------------|------------------------|---------------------|----------------------------------|---------------------------|---------------------------------|--|--|
| Signaller S. . . | 4 | Petrol. | 2/5 | Ether. | Nil. | A little fatty degeneration round portal tracts. Liver otherwise normal. | — |
| Driver C. . . . | 3 | Kerosene. | 3/5 | Morphine. | Nil. | Cloudy swelling only. | — |
| Driver E. . . . | 5 | Kerosene. | 2/5 | "Pentothal." | Nil. | Cloudy swelling only. | — |
| Sergeant B. . . | 8 | Kerosene. | 1/3 | "Pentothal." | Nil. | Cloudy swelling only. | — |
| Driver F.R.E. . . | 10 | Methylated spirits. | 2/5 | — | Silver nitrate. | Cloudy swelling only. | — |
| Lance-Corporal W. | 10 | Petrol. | 1/3 | — | Tannic acid. | Cloudy swelling only. | Died of broncho-pneumonia and septic pleurisy. |
| Private M. . . . | 5 | Petrol. | 2/5 | Nitrous oxide and oxygen. | Tannic acid and silver nitrate. | Very extensive central and mid-zone necrosis. | — |
| Driver F.R.A. . . | 4 | Petrol. | 2/5 | "Pentothal." | Tannic acid and silver nitrate. | Very extensive central and mid-zone necrosis. | — |

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PAPUAN INTERLUDE.

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THIS is not a scientific treatise; it is in fact somewhat frivolous. We have seen a fashionable Harley Street surgeon, in silk hat with Rolls Royce to match, being met each week by his adoring house-surgeon (female) at the hospital gate, and there presented with a glamorous button-hole, with which, perhaps, to brighten his ward rounds. We have searched the literature in vain for any reference to a whole hospital, wards, operating theatre, and—yes—even the mortuary, being gaily decorated with hundreds of gorgeous hibiscus blooms against the coming of the "Big Doctors" to lance a boil! For this and other reasons, we feel that our experiences as "ANGAU" doctors in Papua merit, if not immortality, at least retelling.

What promised to be a period of soul-destroying idleness while our unit was waiting in transit was happily terminated by our appointment as temporary medical officers to the Australian and New Guinea Administration Unit. We are loath to admit that any better selection for this onerous yet highly diverting task could have been made. At the same time it must be conceded that the work was largely medical, and that we, as surgeons, were often in difficulties. We like to think, however, that by much display—and even use—of stethoscopes, and by shameless imitation of many other well-known motions of prominent physicians at the bedside, the prestige of the white man received no serious setback. In any event, we had many physician friends in nearby Australian general hospitals on whom we could depend for advice and caution when really out of our depth. When we are able to state that, in one of our more difficult problems, we were left to choose from typhus, nephritis, malaria, blackwater fever, tuberculous disease of a kidney, malignant disease of a kidney, papilloma of the bladder, and hæmaturia of unknown origin, it will be realized that such help was always freely and willingly given, and that we were duly grateful.

The Australian and New Guinea Administration Unit, generally referred to as "ANGAU", a temporary wartime innovation, controls the welfare and, to a lesser extent the morals, of the native population of Papua and New Guinea. Wherever there are troops native labour is required; "ANGAU" supplies it. To facilitate this, the available native man-power is collected into conveniently situated camps, for the most part beautifully sited, clean and sanitary. Each camp has its dressing station run by a native—usually mission-trained—"doctor boy" (proud he is of his title and sometimes amazingly efficient). These act as "feeders" to the main hospitals, of which, in the area covered by our tour of duty, there were three.



FIGURE I.
Two of the wards.

The main "ANGAU" hospital, holding 140 patients (Figure I) was close to our transit camp. The other smaller hospitals were some distance away, but of similar design. The large hospital consists of six main twelve-bed wards. These—and for that matter all the hospital buildings—are built on piles in true Papuan style. They are roofed with thatched "Sac-Sac" (sago) palm, floored



FIGURE II.
Interior view of a ward.

with narrow strips of gori palm, and open to the weather on all sides. The beds are of simple design, in the form of a table, the mattress being of similar material to the floor (Figure II). There are smaller wards for infectious diseases and for "Marys", and one large forty-bed convalescent ward. In addition there are the usual "A. and D."

room, "Q." store, dispensary and operating theatre. We imagine that this must be the most picturesquely situated operating theatre in the world, on the edge of a steep bank, overlooking a swiftly flowing river, beyond which is dense tropical jungle, vivid-green, fœtid and mysterious. There are no crocodiles.

The operating theatre works extraordinarily well. Though small, it is fly-proofed and airy, and adequate for such surgical procedures and plaster work as we attempted. At first the variety of instruments left much to be desired, and the consternation of one of us, about to embark upon a tendon suture in a child, when handed the only available dissecting forceps which were literally longer than the patient's forearm, can well be imagined. The chief theatre orderly, a native boy of extraordinary perception and alertness, presides over such items as packs, sterilizing and plasters, and is the general "useful" about the place. Fortunately he speaks excellent English, for it would certainly be time consuming to ask for a "you-pull-him-he-come-you-push-him-he-go-big-brother-him-alee-same-akkis" instead of an amputation saw!

As a patient, the Papuan is a unique problem, quite apart from his technical label. Mentally a child, steeped from birth in the mysteries of "dubu" and sorcery, he acquires a curiously fatalistic psychological outlook concerning his immediate affliction. In a private individual, any form of sickness is the result of sorcery, deliberately inspired against him by his enemies or rivals. If he is in government service, any illness or mishap is directly and wholly the fault and responsibility of the government. Should the patient die, a similar assessment of responsibility is made by the relatives, who, however, accept the situation with remarkable sang-froid as one of those things that are merely inevitable. Nevertheless, the sad event is not allowed to pass without remark. This is the Marys' big day. Occupying as they do a purely physiological position in the home, they pursue the obstetric tenor of their way in comparative obscurity. At the passing of the lord and master they are expected to make a fit and proper display of grief and woe. They are rarely disappointing and their leapings and grovellingings, moanings and cavortings would gladden the heart of the most punctilious Irish wake addict.

Their attitude towards the wonders and benefits of medical science is a curious mixture of suspicion and child-like faith. Long association with the Papuan Medical Services has imbued them with tremendous faith in the "needle", for they have seen the most loathsome and hideous manifestations of yaws melt away like snow-flakes in the spring sunshine after a few timely "NABs". They love being radiologically examined. The long-suffering radiologist at a nearby Australian general hospital was often in trouble, deciding which of two natives struggling to get on to the table was the patient, and which the ambulance driver, the latter being firmly convinced that exposure of his body to the "big lamp" would increase the fecundity of his mother-in-law's only daughter. (We interrupt the narrative at this point to recommend a hitherto entirely unexploited field to any enterprising physical therapist.) Once persuaded that surgical procedures are necessary, Papuans submit with surprising meekness—provided they are given "sleep medicine". True to form, they much prefer the needle in the arm ("Pentothal") to traditional rag-and-bottle technique. One patient, after operation, produced some curious looking vomitus, which on closer inspection was seen to consist of spiders, beetles' wings, insects' legs and gnats' bodies. He regarded the fruits of his travail more in sorrow than in anger, no doubt convinced for the time being at any rate that our magic was stronger than his.

Blood transfusions are bigger and better magic, but are regarded with grave suspicion, particularly by the donors. The spectacle of one native, from whom a pint of blood had been taken by methods which were distinctly *sub rosa*, crying out that he had been robbed, and lying down to die, was as pathetic as it was ludicrous. The mixing of blood from different tribes is still as much an offence to the native as would be a transfusion from a non-Aryan to a Nazi. Technique in treatment must at all times be tempered by a proper understanding of these and other

considerations. When taken by and large, however, and notwithstanding an unaccountable (to one of us) aversion to all forms of immobilization, Papuans are most excellent patients.

The patient, with all these complexities of his make-up, arrives philosophically at hospital, usually in an ambulance. Occasionally his arrival is heralded by the characteristic roar of a fast-approaching "jeep". This comes in a cloud of dust, and from it, in addition to the patient, appears a crowd of Americans, usually headed by at least a colonel. The patient's demeanour, a mixture of stoical indifference and not a little wonder at all the excitement, is in marked contrast to the well-meant hustle of his kindly escort. And so to bed. He is now at the mercy of the medical officers, but they too have their troubles.

The approach to the patient is not always easy. In our own hospitals the person on the bed is taken to be the patient. But this is unsound reasoning in a native hospital. There may be three persons on the bed, or one on the bed and six on the floor, any one of whom may be the victim, for his nearest and dearest usually accompany him to hospital to see fair play.

Once, one of us, having located the patient, was listening to his chest (heaven knows why!) when he heard a sound never before described in any book. But, alas! What promised to be a sensational discovery turned out to be merely the squeals of the family pig, safely escosed under the bed as an honoured member of the domestic circle.

The history is always the great thing in medicine, and faithful to our teaching, we attempt to learn it. The complaint may be easy, for most of the surgical conditions are obvious—a lump, a swelling or an injury. But all the medical cases, and some of the surgical cases, call for questions and talk. The medical assistant, with his excellent knowledge of *Motu*, and the "doctor boys", helped us in most instances. It is not always so easy, and on occasions the question travels the difficult journey of five interpreters and five dialects, to the patient, and the answer travels back over the same difficult route. Once we launched the question "does it hurt?", and with rapt attention and a mixture of hope and despair, watched its transmission onwards in a volume of words that seemed out of all proportion to such a simple query. Slowly the reply returned, and our patience was rewarded by the illuminating statement: "He say next week." So we tried to learn the simple phrases and words, and progressed so far as to know that "Me no peck-peck, arse belong me fast" meant constipation. But even this was not much help, for most of our patients with bowel disorders had diarrhoea.

The next problem is one of time—that is, the duration of the complaint and the age of patient. Time means nothing to these people, nor do they reckon it accurately. "Little time", "little long time", "long time", "long little time", indicate a continuous series of periods, but convey nothing to patient or inquisitor, since each or all may mean anything from two weeks to twenty years. Likewise the age of the patient has to be guessed. This is complicated by the fact that children are usually older than they seem, and adults, aging rapidly after thirty, younger than they look. Examinations were mostly straightforward, but even here the unusual was met, and the conversation necessary to explain an imminent rectal examination is too delicate to be mentioned. All of which brings us to the more scientific, and consequently much duller, portion of this account.

Briefly, it may be said that all natives in Papua suffer from malaria, and with few exceptions yaws, so that feverish patients were given quinine and aspirin and those with most other conditions at least some tentative injections of "Novarsenobillon". In a remarkable proportion of cases the patients with fever got well, almost in a matter of hours, while a most astonishing variety of other ailments responded to the blandishments of arsenic. This technique, of course, savours strongly of the now almost extinct "horse-and-buggy" doctor; but it had the inestimable virtue of working in so many not so straightforward cases that it saved two somewhat indifferent physicians considerable mental torment. Occasionally the patients with fevers developed chest complications. We found that pneumonia responded to sulphonamide drugs in the gratifying manner of which we had heard tell. However, let it be stated here

and now, that our methods were by no means always so crude. We bombarded the nearby Australian general hospital with innumerable samples of this and that, and awaited with great interest the verdicts of the radiological and pathological pundits.

Malaria.

Malaria provided us with the greatest number of patients. In the average native, recurrent attacks, though as common as public holidays in Sydney, rarely present alarming symptoms, and respond very rapidly to quinine and aspirin. On few occasions was intravenous therapy necessary.

Several patients with transient hæmaturia, usually at first mildly febrile, were seen. The condition generally cleared up within a few days, and rightly or wrongly was regarded as the mild form of blackwater fever. In one case the hæmaturia was profuse, persisted for some weeks and was accompanied by œdema of the face, trunk, legs and arms *seriatim* and in different combinations. When cystoscopy was possible, the patient was found to have an inoperable carcinoma of the bladder—the only malignant condition, incidentally, that we encountered.

Meningitis.

Meningitis had been, and still is, persistent amongst the natives. One village in particular supplied about a dozen cases. Apart from two patients who were moribund when admitted to hospital, they all made a rapid recovery after lumbar puncture and the administration of sulphonamide drugs.

Dysentery.

Dysentery is, of course, endemic in Papua, and two of the small wards were constantly filled. Probably natives are less distressed by the disease than Europeans; nevertheless they are quickly laid low. Curiously enough, although blood transfusions are still anathema to the majority of natives, intravenous therapy by colourless fluids is very good magic. There were two deaths from dysentery, and although our acquaintance with the condition had hitherto been largely on Army Form GH17 (ward transfers), we could not help but be impressed by the rapid overnight collapse and death. No complications were observed, but we were somewhat pained when the pathologist reported that all he could grow from some laudable pus, skilfully evacuated from a large abscess in the upper part of the thigh of a patient of hitherto unimpeachable integrity, was *Salmonella*, *Bacillus Gärtner*.

Typhoid.

There was only one case of typhoid fever; the patient, as no diagnosis was made until the end of the third week, escaped such well-meant but possibly disastrous therapy as may have occurred to us. The condition was, of course, regarded as an unexplained pyrexia, and many times the pathologist disappointed us by reporting innocent blood films and no reactions to Weil-Felix tests. At long last, one of us recalled a similar temperature chart some twenty years back, before enteric fever had been practically eliminated from metropolitan areas, and sure enough, the Widal test produced a positive reaction. In defence, we would point out that rose spots, like measles, are difficult to see on a mahogany skin, and that enlarged spleens even reaching the right iliac fossa, just do not mean anything in Papua.

Typhus.

Curiously enough, in no case was a positive reaction to the Weil-Felix test obtained during our term of office. Though this may not definitely exclude typhus, we regard it as noteworthy, since many of our troops contracted the disease while serving in the same districts as our patients.

Yaws.

Yaws—and the toast is “arsenic”. Contrary to widely held views on the mainland, yaws is not a venereal disease. It is a highly contagious condition, largely incompatible with soap and water. We never saw—or recognized—a primary lesion, but saw secondary papules by the

thousand. No age seemed exempt; but the children appeared to be almost universally affected, a common site being the anal region and gluteal cleft. But the tertiary lesions were the most interesting, and it was only by the assumption that every native had yaws that humiliating *dénouements* were avoided.

Sabre or boomerang tibias were common, and their radiological appearances were indistinguishable from tertiary syphilis.

Gangosa, the most hideous of all conditions, a nodular, cauliflower-like excrescence, usually affecting the nose, which it appears to spread over half the face, was seen fairly often in adults. Its disappearance, almost without a trace, after the usual standard treatment, really deserves to be rated as one of the miracles of modern medicine.

Crab yaws, in the form of one or more fissure-like ulcers on the sole of the foot, was the only common tertiary lesion that was painful.

Chronic bursitis and joint effusions, the latter especially in the knee, were the only lesions that offered any sort of resistance to treatment. One became infected, and radical drainage was required. Another patient gladdened the heart of one of us by exhibiting all the text-book signs of an early tuberculous hip joint; but the condition responded so rapidly to the first tentative injection of “Novarsenobillon” that the subsequent normal X-ray findings were not required to establish the diagnosis.

Occasionally mass descents were made on unsuspecting villages, where the condition had “got out of hand”. As many as 450 “Novarsenobillon” or bismuth injections were given on one of these field days.

Tropical Ulcers.

Tropical ulcers were commonly seen and were often extensive. They responded to routine dressings and “Novarsenobillon” and after preparation, skin-grafting was satisfactory. The long-standing ulcers may cause gross deformities, but correction is not always possible owing to the prior necessity of healing the ulcers, which frequently encroach upon the proposed operation field. Furthermore,



FIGURE III.

Gross deformity of a leg due to tropical ulcer.

difficulty is often experienced in persuading patients to submit to corrective measures, owing to their philosophical acceptance of long-standing disabilities. There is no evidence that they desire to use them for begging purposes, as is the case in India, though they may yet do so, for civilization can work wonders.

One girl, a lass, aged about twelve years, had a completely useless left hand. As a result of an old, healed ulcer over the back of the joint, the wrist was hyperextended to, and fixed at, a right angle. At operation, the scar was found to have involved and destroyed the three medial extensor tendons. After excision, forcible flexion and subsequent skin graft, a gratifying result was obtained.

Another lady had walked on her knees for the past four years. This she found convenient, because an ulcer over the *tendo Achillis* had caused a complete equinus deformity of the foot, and a nearly right-angled flexion deformity of the knee (Figure III). The ulcer was healing slowly, but was still present, when our tour of duty ended.

Orthopaedic Conditions.

Untreated poliomyelitis, or even beriberi, seemed a likely cause of a few of the deformities seen. Realizing the orthopaedic bent of one of us, our assistants scoured the local villages for material. They produced a most superb congenital *talipes equinovarus*. The deformity was maximal, the weight-bearing surface being the dorsum of the foot. The patient was able to march ten to fifteen miles a day over jungle trails without discomfort, and the skin of the foot was everywhere soft, pliable and free from callouses. Obviously corrective procedures would have been merely meddlesome surgery. Even had they not been so regarded, the fact that she was eight months pregnant would have probably discouraged even the most determined orthopaedist.

Vitamin Deficiencies.

Many vitamin deficiency disorders were seen, but they were not so severe as expected. The administration is responsible for this happy state of affairs, as gardens are supervised and diets supplemented from army supplies.

New Guinea Mouth.

New Guinea mouth is an infective, spongy, granulomatous condition of the gums, seemingly a mixture of Vincent's infection and scurvy. An enterprising and curious medical officer once carried out an experiment. He took 300 patients with this complaint and treated groups of 100 with (i) "Novarsenobillon", (ii) ascorbic acid and (iii) carbolic mouth washes. They all did equally well.

Edema.

Swellings of the heel and ankle, extending up the *tendo Achillis*, suggested an inflammation of the mythical sheath surrounding that tendon. However, the swellings were scorbutic in origin, and readily responded to vitamin C.

Subperiosteal Hemorrhage.

A sudden painful swelling in the region of a child's elbow, in the absence of any available history, suggested a fracture, but X-ray examination showed us to be wrong. On general principles, the limb was immobilized in plaster, until a subsequent X-ray examination revealed extensive periosteal elevation of the lower end of the humerus so commonly seen in scurvy. The condition improved rapidly with the institution of more scientific and specific treatment.

Beriberi.

In all cases beriberi was of the dry form and gross oedema and cardiac distress were not seen. In the neuritic types, motor manifestations were our guiding lights, as it was impossible to carry out tests for sensation, though complaints of pain were not uncommon. Foot-drop, step-gait, loss of reflexes, wasting both muscular and general, and positive squatting test results were all seen.

Skin Diseases.

Tinea infections accounted for most of the skin disorders. They were numerous and varied, and called "*Sopoma*" by the natives. *Tinea imbricata* is the most picturesque, and the concentric designs in its early stages reminded us of the mazes one sees in magazines, in which one is challenged to get from point A to point B without crossing a river. The condition was treated with salicylic acid with excellent results, though the "locals" swear by resorcin ointment, which in many districts is used exclusively.

Scabies is very common and is nearly always infected in the usual grand manner. All the doctor boys readily recognize scabies, and just as readily treat and cure it with sulphur.

Tuberculosis.

Unfortunately pulmonary tuberculosis is common amongst Papuans, and it is believed to be increasing. There are no adequate facilities for dealing with the disease. Those patients who do not die in hospital are returned to their own villages, there, no doubt, to spread their infection. The hopelessness of the situation inspired us to furnish a report to the proper authority, in which we advised the establishment of a suitable sanatorium of at least 200 beds (to start with), and the training of a special staff in the treatment of tuberculosis, both medical and surgical.

Tuberculous Spine.

Two patients suffering from tuberculous spine were seen; but their treatment was complicated—as indeed was that of most of the orthopaedic problems—by the natives' dislike of immobilization. Plaster jackets and spicas proved to be the only practical measures. Amazingly rapid progress of the lesion was demonstrated in one case. After one X-ray examination had revealed no abnormality, a second six weeks later showed gross destruction of two adjacent vertebrae and the intervening disc.

Fractures.

In the small number of fractures due to war wounds, union occurred more rapidly than is usual in Europeans.

One patient suffering from a fractured spine insisted on the removal of his plaster jacket after but a few weeks' immobilization. "Angau" punished him, on the grounds of a self-inflicted wound, by imposing taxes on him for the remainder of the period that he would normally have been immobilized. To the mortification of one of us, he paid them with a most unseemly and quite uncalled-for display of enthusiasm.

Rehabilitation is fraught with numerous problems, not least, paradoxically enough, being the absence of footwear. It is difficult enough to instruct a native in quadriceps therapy, but far more so in the art of corrective exercises and the proper method of walking after a fracture near the ankle joint. A European is normally fitted with a Thomas heel, outside iron, and inside T-strap, and these require the patient, to some extent at least, to do the right thing when the surgeon's back is turned. No such artificial aids are as yet feasible in Papua.

For a somewhat similar reason, "site of election" amputations and even carefully designed and executed stumps are of less moment in a country where, to date, artificial limbs are unknown. Owing entirely to the absence of footwear, the common foot disabilities which are both the plague and the bread and butter of the consultant orthopaedist, were simply not seen. One wondered also if the rarity of internal derangement of the knee-joint (we saw no case) may also be due, partly, to this phenomenon.

General Surgery.

Surgery is surgery the world over, and a hernia is a hernia, no matter what the colour of the patient. In Papua most things were big—herniae, hydroceles, abscesses (one of the last-mentioned yielded three and a half pints of pus). Conditions were often far advanced when the patient was first examined, and we viewed with some diffidence the performance of major procedures with an untried and partly native operating theatre team. But faced with two herniae and two spines, the latter requiring plaster jackets, we decided to risk it. We need not have worried, for the team work and set-up were excellent. So we "did our stuff" with not a little exhibitionism, and obviously tolerant patience. The patients returned to bed in good condition, as in all the best hospitals. Next morning we arrived, comfortably expecting to find all well. But we had not realized the natives' reaction to air-raids, one of which had taken place overnight. True to form, they had "gone bush" *en masse*, fording the river in the process. One of us gazed with horror, amounting almost to disbelief, at the wreck of yesterday's beautiful plaster casts, while the other wept silently over a scrotal hematoma the size of a football (soccer).

War Wounds.

Many young Papuans volunteer for the Papuan Infantry Battalion and take part in patrols against the Japanese alongside our own troops. Others act as carriers in front-line areas. Casualties were at times heavy, and we always had a number of battle casualties in the wards. They were treated as our own men, passing through main dressing stations, surgical teams, and casualty clearing stations. Their wounds, treated on orthodox lines, did well.

Infections.

Vitamin deficiencies undoubtedly lower resistance to infection. We saw a case of *cancrum oris*, previously encountered only in gruesome pictures in text-books. Almost before our eyes, a brawny cellulitis of the lower lip became a foul slough, and though the condition was checked, two-thirds of the lip on one side was destroyed.

Madura Foot.

The sight of a boy, aged about fifteen years, listless, gaunt of face, thin as a skeleton, with a match-like lower limb terminating in a bandaged swelling the size of a football (rugby), was a shock to us (Figures IV and V). The removal of the bandage released an appalling smell and exposed a revolting sight. The whole foot and the lower third of the leg were enormously swollen and studded with large pouting sinuses, discharging a thin gelatinous pus. The smell prevented too close an examination, and we just managed to order antiseptic dressings and "Novarsenobillon" (hopefully and subconsciously) before making for the fresh air. During the next few days we were able to consider the matter carefully in the sweetness of our tent, with the assistance of Manson-Bahr. This author's description and illustrations of Madura foot left no doubt in our minds as to the diagnosis. X-ray examination revealed the gross destruction of all the bones of the foot, with small areas of osteosclerosis. Our only disappointment was our failure to find the characteristic fungus. However, as we have always been taught—except by pathologists—that laboratory tests are not the be-all and end-all, but merely links in the chain of evidence, we ignored the absence of mycetoma, and amputated the foot. In a few weeks the boy's improvement, both mental and physical, was astounding. When we left him, he was cheerful and very fat.



FIGURE IV: Madura foot.



FIGURE V: Madura foot.

Filariasis.

In our early days, one of us, keen on the diagnosis of lumps, found all the classical signs of lipoma in the groin. The diagnosis was made with a confidence that was rudely shaken when twenty such lumps were seen in one round of the hospital. They were varicose filarial glands.

Elephantiasis of both extremities was seen, but in none of the many hydroceles encountered was the fluid chylous. We have seen many extraordinary manifestations of elephantiasis pictured in books on tropical medicine. We felt rather cheated, as did the man who found that most of the cats on the Isle of Man had tails, when we failed to see the scrotal monstrosities we expected to find everywhere.

Our satisfaction was great, however, when, in our last week of duty, the picture came to life (Figure VI). The huge leathery scrotum, reaching to the knees, supported but scarcely concealed by a "ramt" (Figure VII), with the position of the penis recognized only by a slit-like depression, was to us an amazing sight. Bulging inguinal

FIGURE VI.
Filariasis of the scrotum.FIGURE VII.
Filariasis of the scrotum,
as worn.

glands and enormously swollen legs completed the picture. But a lesson in how to overcome a serious disability, and even turn it to advantage, was given us, when, at meal times, the patient sat on the bed, legs apart, and balanced his plate firmly on his scrotum. This condition was regarded by us as just an interesting specimen, but beyond treatment. But the owner had come 100 miles to have the mass removed, so one of us was "on a spot". Strangely loath to operate, urged on by other—not involved—medical officers, but still in doubt, he turned to Manson-Bahr, there to find that operation was in order. His conscience now clear, the deed was done. The testicles were normal in size, but the cords were greatly elongated and oedematous. These structures were preserved. The skin was leathery in consistence, and suturing required stout, very sharp cutting-edge needles. Hemorrhage from large veins, running in tunnels in tough subcutaneous tissue, was free, calling for a large number of strong hemostats, which were not available. The operation was long, but a subsequent copious blood transfusion restored the patient's condition. The scrotum was reduced to reasonable dimensions, with a portion of the penis visible. The final result was a source of great satisfaction to the patient, whose only problem now is how to manage his meals.

Here may be mentioned a condition that we regard as a filarial manifestation, though with no certainty. It consists of the sudden appearance of a hard, brawny, relatively painless swelling involving subcutaneous tissues. When we first saw one, we ordered the application of heat, and waited for the seemingly inevitable suppuration. Nothing of the sort happened, for after a few days the mass began to subside and gradually disappeared. All temptation to incise or excise these swellings has long since left us.

In one instance the elephantiasis had a superimposed infection and presented an alarming appearance.

The whole arm and forearm were enormously swollen, tense almost to bursting point, and hot, while a large mass of glands was present in the axilla. The patient's temperature was 105° F., and he was in *extremis*. Multiple incisions down to and through the deep fascia revealed no pus, nor did they save the patient. A post-mortem examination revealed the subcutaneous tissues to be a diffuent, yellowish-grey, pultaceous mass; this condition extended across the axilla to the shoulder and down to the abdominal wall. In none of the organs was any gross change detected.

Abdominal Surgery.

There was no abdominal surgery.

One small child, aged about six years, had a perfect ileostomy in the lower part of the abdomen, towards the right side (Figure VIII). No history was, of course, available, except that the condition was alleged to have appeared after a "sore". The opening was about two inches in diameter, and small-bowel contents were discharged every few hours. Extensive scarring of the abdominal wall, extending from the flank to the mid-line, and surrounding the exposed bowel, was present. This appearance strongly suggested an original laceration of the abdominal wall, with penetration of the peritoneal cavity. The remarkable features were the survival of the child from the injury (?), her excellent general condition, and the complete absence of any trace of irritation of the surrounding skin. For various reasons, including the difficulty of post-operative treatment, operation was postponed.



FIGURE VIII.
Natural ileostomy in a child.

Appendicitis.

Appendicitis is apparently unknown. We saw no case during our four months' period at the hospital. Why this is so we do not know, and it is of course no new observation. One of us is not interested in the phenomenon (for plaster fixation never has been accepted as a form of treatment), but the other definitely is. Fellow surgeons may rest assured that, should the reason for this immunity be discovered, it will never be revealed, for, like the death ray, the results would be too terrible to contemplate.

Comment.

During one ward round a native was noticed laboriously reading a book. The amused interest excited when it proved to be a volume of Damon Runyan was duly noted by the rest of the ward. Next day another boy was noticed poring over a copy of *Guinea Gold*, no doubt hoping

to attract attention; he did, for the paper was upside down.

We left our assistants to explain to a patient the perfectly honourable intentions of one of us in the matter of a small hernia. He was even induced to compare notes with several other patients, convalescing after operation for the same condition. He was very impressed, very impressed indeed. In fact, he ran away ("escaped", as the other of us smugly remarked).

We found not a little disconcerting a verse-by-verse recital by a whistling virtuoso, of "Hymns, Ancient and Modern" during the whole of a ward round, including the examination of the patient himself. He had begun his self-imposed task after breakfast, and did not pause until he had whistled the last verse on the last page, shortly before sundown.

Many other singular and amusing incidents occurred, such as that of the small child, thought to be suffering from no less fell a disease than acute osteomyelitis of the humerus, who, before our astonished gaze next morning, was seen running about the hospital grounds, the picture of naked health, with a live mouse on the end of a string. Such events all helped to keep our ego in check, and to make our association with "ANGAU" a source of constant joy. Through fear of being tiresome, however, we draw our narrative to its close.

Conclusion.

Our numerous colleagues in nearby Australian general hospitals were always so helpful and encouraging that it is a pleasure to render thanks. To Major E. R. Crisp, radiologist, whose handling and sorting of many enthusiastic clients was the epitome of tact and patience, and to Captain J. V. Hicks, pathologist, for his ever-ready and enthusiastic help, we are especially grateful, the more so because they were both, at the time, busy with the work of their own hospital. The work of the European ward orderlies, Sergeant Turner and Corporal Boecke, who disciplined and controlled not only the patients, but also the native "doctor boys", was of the highest order. Lieutenant Walshe, officer administering the native hospital, disguised a high degree of efficiency with a cheerful, almost effervescent disposition that was always a pleasure to encounter. Since he spoke *Motu* and "Pidgin" fluently, and could make himself understood in several other dialects, performed minor surgical procedures with precision, and was never known to fail at a lumbar puncture, he proved to be a veritable "Admirable Crichton". And, lastly, we record our gratitude to Kipoo, our coal-black Buka-boy driver, who piloted our springless "jeep" over the most appalling roads with such skill and dexterity that he never gave us an unnecessary bump, never drove too fast, and invariably operated the starter-button with a prehensile great toe.

In handing over our patients to a colleague, and passing on to what we think is a more suitable sphere of activity, our final impressions are of profound thankfulness that, in matters obstetric, Papuans still prefer their own methods to white man's magic, and a feeling that we have now only to meet a goitre on a wheelbarrow, and our education is complete.

Acknowledgement.

Our thanks are due to the Director-General of Medical Services for permission to publish this account.

THE LENGTH OF THE SMALL INTESTINE.

By J. B. CLELAND, M.D.,
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of Adelaide.

IN 1941, during the course of a post-mortem examination on a woman, aged fifty years, who had had an organizing pneumonic exudate, the small intestine, as it was detached, seemed so short that I measured it and found that it was only 15 feet long from the termination of the duodenum to the caecum. The woman was of short stature, as her coffin measurement was only five feet six inches. This led to my making a series of measurements of the jejunum and ileum

in over 100 bodies; my observations showed that remarkable variations existed, ranging from 13 feet (in two cases) to 37 feet. The intestine (jejunum and ileum only) was measured after having been detached from the mesentery as close as possible to the intestine itself, in such a way that the gut scissors could rapidly slit up the lumen. Probably a number of small kinks were left, varying from subject to subject, so that all the measurements probably are somewhat less than the actual length. Arranged in order the results obtained are as follows (inches being neglected):

The combined results in 100 subjects of both sexes were: 13 feet, two subjects; 15 feet, two subjects; 16 feet, four subjects; 17 feet, two subjects; 18 feet, three subjects; 19 feet, four subjects; 20 feet, three subjects; 21 feet, twelve subjects; 22 feet, seven subjects; 23 feet, sixteen subjects; 24 feet, five subjects; 25 feet, six subjects; 26 feet, thirteen subjects; 27 feet, nine subjects; 28 feet, five subjects; 29 feet, two subjects; 30 feet, one subject; 31 feet, one subject; 33 feet, one subject; 35 feet, one subject; 37 feet, one subject.

The results in 60 male subjects were: 13 feet, one subject; 16 feet, two subjects; 17 feet, one subject; 19 feet, two subjects; 20 feet, two subjects; 21 feet, four subjects; 22 feet, five subjects; 23 feet, ten subjects; 24 feet, five subjects; 25 feet, six subjects; 26 feet, nine subjects; 27 feet, five subjects; 28 feet, two subjects; 29 feet, one subject; 30 feet, one subject; 31 feet, one subject; 33 feet, one subject; 35 feet, one subject; 37 feet, one subject.

The results in 40 female subjects were: 13 feet, one subject; 15 feet, two subjects; 16 feet, two subjects; 17 feet, one subject; 18 feet, three subjects; 19 feet, two subjects; 20 feet, one subject; 21 feet, eight subjects; 22 feet, two subjects; 23 feet, six subjects; 26 feet, four subjects; 27 feet, four subjects; 28 feet, three subjects; 29 feet, one subject.

The figures show that the small intestine may be quite short in both males and females; but whereas five male subjects out of 60 had a small intestine 30 feet in length or more, none of the 40 female subjects had a small intestine longer than 29 feet. The length did not seem to bear any definite relationship to the length or size of the subject. Even children may have a longer small intestine than some adults; it measured 28 feet in length in a boy, aged fourteen years, 19 feet 6 inches in a girl, aged 9 years, and even 16 feet 4 inches in a male infant, aged nine weeks, and 15 feet in a female infant, aged three months.

The following is a list of the thirteen lowest measurements, together with the diseases from which these subjects suffered—though I can see no connexion between the diseases and the length of the jejunum and ileum.

A woman, aged forty-six years: 13 feet, carcinoma of the stomach; a man, aged fifty-one years: 13 feet, dysentery (perhaps amoebic); a woman, aged fifty years: 15 feet, organizing pneumonic exudate; a woman, aged eighty-one years: 15 feet six inches, cerebral hæmorrhage and diverticula in the jejunum; a woman, aged forty-six years: 16 feet, ulcerative colitis; a man, aged fifty-nine years: 16 feet, Hale-White cirrhosis of the liver; a woman, aged seventy-three years: 16 feet, gall-stone with intestinal obstruction; a man, aged sixty-five years: 16 feet 6 inches, massive tuberculosis of the mediastinum; a man, aged seventy-one years: 17 feet, intestinal obstruction from a band, bronchiectasis, bilateral hydronephrosis; a woman, aged twenty years: 17 feet 6 inches, biliary cirrhosis; a woman, aged fifty-three years: 18 feet, localized colitis with infection of the wall; a woman, aged fifty years: 18 feet, carcinoma of the cervix; a woman, aged 64 years: 18 feet, pancreatic disease with fatty necrosis.

In the four cases in which the length of the small intestine was over 30 feet, the particulars are as follows.

A man, aged fifty-five years: 37 feet, duodenal ulcer; a man, aged twenty-two years: 35 feet, diabetes; a man, aged twenty-nine years, 33 feet 6 inches (coffin measurement, 6 feet 1 inch), hypertrophied and dilated heart; a man, aged seventy-four years, 31 feet, duodenal ulcer and diverticula in the jejunum.

The bodies of two full-blooded Australian natives were examined, with the following findings: in a woman, aged twenty-two years, the length of the small intestine was

21 feet 6 inches; in a man, aged thirty-five years, the length was 16 feet 6 inches. In a female half-caste, aged thirty-five years, the small intestine was 28 feet long, and in a half-caste boy, aged twelve years, it was 21 feet 6 inches long.

Besides this half-caste boy, in a white girl, aged nine years, the small intestine was 19 feet 6 inches in length, and in another, aged five years, it was 16 feet 8 inches in length. In a boy, aged fourteen years, it was 28 feet long. In one infant the small intestine was 10 feet long, in another female infant, aged twenty-two days, it was 18 feet 8 inches long, in a male infant, aged three weeks, it was 13 feet long, in a female infant, aged three months, it was 15 feet long, and in a male infant, aged nine weeks, it was 16 feet 4 inches long.

These variations in the length of the small intestines were to me surprising. As far as one could tell, subjects with short intestines had not been handicapped in any way during life.

Area of the Small Intestine.

It may be of interest to see the amount of area occupied by the mucosa of the small intestine (the folds being neglected). The width is from about 2.5 to 3.0 inches in the upper part of the jejunum to 2.5 inches lower down and sometimes only 2.0 inches in the ileum. If the average is taken as 2.5 inches, the length of 13 feet would give a surface of about 390 square inches (2.7 square feet), whereas if the length was 37 feet, the area would be 1,110 square inches (7.7 square feet). One would think that such a difference in area would have some effect upon the physiology of the subject; but it seems useless to speculate at present as to what this effect would be.

Reports of Cases.

UNUSUAL INFECTIONS WITH THE NEISSERIA.¹

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SEVERAL UNUSUAL cases of infection by members of the Neisserian group have occurred at the Royal Prince Alfred Hospital and at other hospitals in Sydney during recent months.

The Neisseria—that is, the Gram-negative cocci usually arranged in pairs—generally keep rather closely to certain parts of the body. The gonococcus, the causative organism of gonorrhœa, is found in the genito-urinary tract, and the other members of the group which have been described keep almost entirely to the naso-pharynx, with the exception of the meningococcus, which invades the meninges and causes epidemic cerebro-spinal meningitis, and also *Neisseria flavescens*, which on rare occasions has caused the same disease.

In most routine laboratories, in distinguishing the various members, perhaps rather too much reliance has been placed on the situation in which the Gram-negative diplococcus is found. In view of the cases to be described it appears necessary for us to adopt as a routine more careful methods of differentiation than have been used hitherto.

The differentiation of the meningococcus and the gonococcus is not easy. They are so nearly related biochemically and antigenically that separation of the two is difficult.

(i) Their morphology is of little value. Some minor differences occur, such as the fact that the adjacent sides of the meningococcus are said to be flatter than those of the gonococcus; but these differences are of little help.

(ii) Culture and colony formation are most important, for

¹ Read at a meeting of the Society for Experimental Biology of New South Wales in April, 1943, at Sydney.

as a rule the meningococcus grows more rapidly and easily and gives bigger and more luxuriant colonies than the gonococcus. Some workers hold that occasional strains of meningococci can give small colonies very similar to the gonococcus, but Branham, Mitchell and Brainin⁽¹⁾ state that such colonies were never encountered by them in meningococci. (iii) All known strains of meningococcus are emulsified readily in a 1/10 dilution of horse serum in normal saline solution, whereas many strains of gonococcus are not emulsified readily. (iv) Serological identification is not satisfactory, as polyvalent meningococcal antiserum and gonococcal antiserum agglutinate both organisms. Complement fixation with a patient's serum only indicates an infection with a member of the Neisseria. (v) Fermentation reactions seem to be the most helpful. An enriched medium must be used. Carpenter and Charles used as their enriching substance either ascitic fluid or a dried hemoglobin put up by "Difco". Horse serum may be used, but it must be heated to 65° C. for sixty minutes to destroy the native maltase. The organism, too, must be subcultured into the sugars from a medium which does not contain maltase. At this hospital we use the method recommended by Dr. N. E. Goldsworthy and Dr. J. Still. Small quantities of medium are put up in wide-bore tubes to allow the adequate aeration which seems to be an important factor. The medium consists of peptone water (1%), Andrade indicator (1%), sugar (1%), and then inactivated horse serum (horse serum heated to 65° C. for sixty minutes) added in quantities of 0.5 cubic centimetre to every 2.0 cubic centimetres of the medium. The meningococcus ferments glucose and maltose and the gonococcus ferments glucose only. Known strains of gonococcus and meningococcus are put up at the same time.

A little over eighteen months ago a young man was admitted to Royal Prince Alfred Hospital suffering from meningitis. (This case has previously been reported in detail⁽²⁾.) Lumbar puncture revealed turbid cerebro-spinal fluid. No organisms were found amongst the numerous pus cells present in the direct smear made from the fluid, but the culture produced small translucent colonies of Gram-negative diplococci. This type of colony should have given me a lead as to the possible nature of the organism, but a diagnosis of meningococcal meningitis was made. The patient received the appropriate treatment with sulphonamides and made a rapid recovery. Nine days later, however, when he appeared well and his cerebro-spinal fluid contained no leucocytes and was sterile, he still had a mild elevation of temperature. The next day epididymitis developed, and although no obvious discharge was present, a smear made from material obtained by prostatic massage revealed Gram-negative intracellular and extracellular diplococci. Culture of this material yielded colonies similar to those recovered from the cerebro-spinal fluid. Fortunately this original meningeal strain was still in the laboratory, and on further investigation by the fermentation reactions and their ability to be emulsified, both these organisms were found to be gonococci.

Looking through the literature, one finds that about fifty cases of gonococcal meningitis have been recorded, although in all cases the identity of the organism has not been fully established. It is interesting to note that of some 500 cultures received at the Institute of Health at Washington to be typed as meningococci, five meningeal strains were found to be gonococci and not meningococci, and five strains isolated from the blood were also proved to be gonococci and not meningococci.

Not long after this case of gonococcal meningitis had occurred, a child suffering from vulvo-vaginitis was admitted to the venereal ward at the Royal Prince Alfred Hospital. There was no history of contact with venereal disease. Examination of a swab taken from her vagina showed Gram-negative intracellular and extracellular diplococci; but culture of this material yielded a Gram-negative diplococcus which by fermentation reactions proved to be a meningococcus and not a gonococcus.

In June, 1942, Carpenter and Charles,⁽³⁾ at the School of Hygiene and Public Health of the Johns Hopkins University, reported the isolation of the meningococcus from the genito-urinary tract of seven patients. These patients were known not to have a meningococcal infection elsewhere. The strains fermented glucose and maltose, and Dr. Sara Branham further classified them as belonging to the group I meningococcus. We therefore have evidence of infection of the genito-urinary tract with the meningococcus.

Since the beginning of last year, in three cases of acute conjunctivitis a meningococcus has been grown (identified by fermentation reactions).

Recent literature provides reports of cases similar to these meningococcal eye infections. Clifton and Laird,⁽⁴⁾ of the

Royal Army Medical Corps, in 1941 reported two cases of acute meningococcal conjunctivitis. In only one of these, however, was the organism confirmed as a group I meningococcus; the other case was diagnosed as of meningococcal origin on circumstantial evidence only.

Discussion.

It seems then that the meningococcus has been trespassing on the preserves of the gonococcus and vice versa. This may be a new development, or it is possible that although it has occurred it has not always been recognized.

It has been suggested that the two organisms have undergone a change as a result of the intense attack on them in the last few years with the sulphonamide drugs, and their relationship, close as it has always been, has become an even closer one in adversity, so that each can almost regard the other's home as its own. Our three cases of meningococcal conjunctivitis, however, and three of Carpenter and Charles's cases, occurred in untreated patients. Still, it is possible that just as sulphonamide-resistant strains can be produced which retain this characteristic in successive generations, a gonococcus can change its biochemical properties as a result of contact with the sulphonamide drugs and then reproduce itself and be passed on in this changed form.

There does not appear to be much doubt that gonococcal meningitis occurred before the introduction of the sulphonamide drugs; but the occurrence of meningococcal infections of the genito-urinary tract arising independently of a meningococcal infection elsewhere has not been reported until recently. This, of course, may be due to the fact that cultural diagnosis of gonococcal infections has not been used to a great extent until comparatively recently.

The epidemiological aspect of these odd cases is very interesting. The case of meningococcal vaginitis at this hospital and the reported cases of meningococcal urethritis occurred at a time when meningococcal meningitis was prevalent—that is, when the carrier rate of meningococci was high. The significance of this cannot be assessed at present; but if the ability of the meningococcus to invade the genito-urinary tract is a new departure, it may prove to be of great importance. If such cases can arise from contact with patients suffering from meningococcal infection or from contact with carriers of the meningococcus, the control of this spread of non-venereal "gonorrhoea" due to a meningococcus may be necessary and difficult.

With regard to the gonococcus, it seems possible that in communities such as military camps, where gonococcal infections may be present, meningitis may sometimes be gonococcal and not meningococcal.

That the gonococcus may invade or be harboured in the upper part of the respiratory tract and be passed from one patient to another in the same way as the meningococcus apparently is, and yet still retain its invasiveness for the genito-urinary tract, is not outside the bounds of possibility and may lead to all kinds of difficult problems. In fact, many interesting questions and difficulties come to one's mind in the light of this interchange of abode of the two well-known pathogenic members of the Neisseria. When cultural identification with fermentation reactions of all Gram-negative diplococci becomes universally employed in laboratories, further information will gradually accumulate and these "unusual cases" will be seen in their proper perspective.

Summary.

1. A case of gonococcal meningitis, a case of meningococcal vulvo-vaginitis and three cases of meningococcal conjunctivitis are reported.
2. The possible significance of this interchange of habitat is discussed.

References.

- (1) S. Branham, R. H. Mitchell and W. Brainin: "Gonococcal Meningitis", *The Journal of the American Medical Association*, Volume CX, 1938, page 1804.
- (2) J. Armytage: "Gonococcal Meningitis", *THE MEDICAL JOURNAL OF AUSTRALIA*, Volume I, 1942, page 229.
- (3) C. Carpenter and R. Charles: "Isolation of Meningococcus from the Genito-urinary Tract of Seven Patients", *The American Journal of Public Health*, Volume XXXII, June, 1942, page 640.
- (4) F. Clifton and S. M. Laird: "Acute Meningococcal Conjunctivitis", *The Journal of the Royal Army Medical Corps*, Volume LXXVII, 1941, page 318.

Reviews.

MEDICAL TREATMENT.

READING a book written on treatment makes one wonder if the future may not produce a special class of doctors who are almost solely therapists. If so they will need boundless enthusiasm as well as judgement and knowledge. But the general practitioner of today, who has to cover so many fields, will find much that is helpful to him in the third edition of the "Textbook of Medical Treatment" of D. M. Dunlop, L. S. P. Davidson and J. W. McNee.¹ The value of this book is firmly established, for the first edition was published just before the outbreak of war. The new edition increases the size of the book by forty pages, but it is still of convenient size. Happily the authors have been content to retain their policy of avoiding undue compression, for all sections of the book are easy to read and contain ample detail. The cautious and thorough traditions of the Edinburgh School are maintained as before, and while the authors point out the directions in which advances are being made and give adequate accounts of recently proved methods, they have preserved a good balance between the old and new. The use of sulphonamide drugs is treated in a separate section, which saves repetition. The newest members of the group are not yet mentioned, but advances along such lines are certain to outstrip text-books; this is also so in the case of penicillin. The special section on procedures is a very valuable feature. The exact information concerning oxygen administration, for example, is most useful. The treatment of peptic ulcer is conservative; fortunately it looks as if the call for a sound nutrition and a reasonably integrated life are swinging the medical world away from the extreme forms of what might be called Sippyism. Hypertension is another subject in which the conditions of life of the patient are properly emphasized. Certain of the newer developments such as the importance of the rhesus factor, male hormonal therapy, and the application of surgery in cardiac disease are given sufficient space to be informative.

In general, the book has been brought as well up to date as is readily practicable in such a work, and it may be confidently recommended as a text-book on medical treatment. The subjects are wisely discussed and necessary detail is given; only reliable and proved methods are advocated, but except where the authors believe real doubt exists the advice is downright and definite. Handling this book makes one admire the resource that can so well produce a volume in Britain in time of war.

INFECTIOUS DISEASES.

WAR hath her victories no less renowned than peace. Under the stimulus of necessity, the scope of both field and laboratory work on infectious diseases has been enlarged in all directions. During the past four years so much has been published of clinical and experimental observations, of preventive measures, and above all of new methods and new applications of treatment, that the desirability of the collection and setting out of new data by competent and experienced men has been evident for some time.

For this reason the appearance of a second edition of "Clinical Practice in Infectious Diseases" is to be welcomed.² In their preface the authors apologize for delay in its publication; it is rather a matter for surprise that two busy men could find time to survey a vast literature, assess evidence, and state their conclusions within the limitations of time and space imposed. The book is highly condensed; as with the first edition, the authors have appraised rather than discussed. They have not hesitated to be dogmatic where their way appeared clear; in obscure matters they have simply expressed their opinions, and where new evidence of a controversial nature has been brought forward

they have set it down dispassionately. This is all to the good, for the book is one for senior students, resident medical officers, and general practitioners, who wish not only for immediate guidance, but for data which they can consider and apply to their own experience.

The volume has been much enlarged. A hundred pages have been added. Most of the new matter has been set in smaller type, and a number of tables have been omitted. Additions and amendments have been made to every chapter, and a brief synopsis has been placed at the head of each. Doubtless this is of value to the student working for examinations, but otherwise the necessity for it is not apparent.

The general form and order of the book have not been changed greatly, but the chapters on hospital management have been placed at the end, with two entirely new chapters dealing with isolation and chemotherapy. In the former the subject of cross-infection is discussed, and the use for preventive purposes of structural and nursing separation, spacing and ventilation, air disinfection and dust laying are described. The sub-chapter on chemotherapy is one of the most valuable in the book. The practical aspects of dosage and administration both in acute illness and for chemoprophylaxis, and the by-effects are described fully and attractively, and sound advice is given on management of all types of cases.

The difficult subjects of epidemic encephalitis and infective jaundice are treated cautiously; reference is made to recent work on infective hepatitis, the importance and frequency of which have increased greatly during the war. Attention is again directed to chronic meningococcal septicaemia. The common diseases of childhood, measles, whooping cough and enteritis, are dealt with rather briefly, but all the essentials are included. The same applies to streptococcal infection, which provides too large a subject for detailed consideration in a book of this size. The pages on the differential diagnosis of tonsillar and pharyngeal diphtheria are admirable. The chapters on smallpox, enteric fever and typhus have been revised, but they were so excellent in the original edition that there has been little to add, excepting an outline of instructions for protection against typhus.

Altogether, in its scope and for its purpose, this is the best book in the language. If the authors can maintain the same discretion and judgement in subsequent editions, it is not likely to be displaced.

A HANDBOOK FOR DENTAL SURGEONS.

THE authors of "The Dental Surgeon's Handbook", Marzell and Max Bronner, in the space of 250 pages cover many phases of medical and dental practice.¹ Their knowledge is sound and all recent developments in therapy are included. Chapters are devoted to disease of the oral cavity, bacteriology, *materia medica*, a classification of the most important pharmaceutical products according to their action. Part II of the publication is purely dental, being concerned with orthodontics in daily practice. On page 23 a timely word of advice is recorded for both dentist and physician: "Extractions are contraindicated in the case of (a) the presence of bacteria in the blood, (b) severe nephritis, (c) the progressive diseases of the joints, (d) rather high fever in the acute stage. Never extract too many teeth at the one time."

Notes on Books, Current Journals and New Appliances.

PHYSICAL SIGNS IN CLINICAL SURGERY.

THE author and publishers of "Demonstrations of Physical Signs in Clinical Surgery" certainly have lived up to the highest standards in introducing further improvements in the ninth edition of this publication.² Thirty-seven illustrations have been added and the letterpress has been again amplified. This book is indispensable to the medical student and invaluable to the practitioner.

¹ "The Dental Surgeon's Handbook: Modern Dentistry in Daily Practice", by Marzell Bronner, D.M.D., and Max Bronner, D.M.D.; 1944. Bristol: John Wright and Sons Limited. 7½" x 5", pp. 256, with illustrations. Price: 21s. net.

² "Demonstrations of Physical Signs in Clinical Surgery", by Hamilton Bailey, F.R.C.S. (England); Ninth Edition, revised; 1944. Bristol: John Wright and Sons, Limited. London: Simpkin Marshall (1941) Limited. 8½" x 5½", pp. 360, with many illustrations, some of which are in colour. Price: 25s. net.

¹ "Textbook of Medical Treatment", by various authors, edited by D. M. Dunlop, B.A., M.D., F.R.C.P., L. S. P. Davidson, B.A., M.D., F.R.C.P. (Edinburgh), F.R.C.P. (London), and J. W. McNee, D.S.O., D.Sc., M.D., F.R.C.P., with an introduction by the late Professor A. J. Clark, B.A., M.C., D.P.H., F.R.C.P., F.R.S.; Second Edition; 1942. Edinburgh: E. and S. Livingstone. Demy 8vo, pp. 1,203. Price: 25s. net.

² "Clinical Practice in Infectious Diseases: For Students, Practitioners and Medical Officers", by E. H. R. Harries, M.D. (London), F.R.C.P., D.P.H., and M. Mitman, M.D. (London), M.R.C.P., D.P.H., D.M.R.E., with a foreword by W. Allen Daley, M.D. (London), F.R.C.P., D.P.H.; Second Edition; 1944. Edinburgh: E. and S. Livingstone. 8½" x 5½", pp. 582. Price: 22s. 6d. net.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 30, 1944.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE EVALUATION OF NEW REMEDIES.

WHILE in certain circumstances it may be true that "in the multitude of counsellors there is safety", it will oftener be true that "where no counsel is, the people fall". These ideas are interesting when they are applied to the medical practitioner and to the drugs and other remedies that are available for his use. The practitioner finds that most of his requirements are met by remedies listed in the official pharmacopœia, but a host of others are brought to him by enterprising drug houses. The field of therapeutics has been enriched by the explorations and ingenuity of the manufacturing chemist. Nearly all the larger houses have research departments staffed by competent investigators, and medicine owes a great deal to the carefully directed adventures of these workers. But these houses are commercial undertakings and naturally wish to sell their products. As a result the practitioner may be embarrassed by the riches from which he has to choose, particularly when preparations essentially similar have as many different names as there are manufacturers. Unwarranted claims may be made for the efficacy of a preparation, and if this happens there will be no safety in the multiplicity of counsellors. And where there is no counsel the practitioner may fail. It is sometimes held that the average practitioner is capable of judging the value of a product. He has certainly been trained to observe clinical responses; but in this regard the suggestion has been made in a recent statement by the Council on Pharmacy and Chemistry of the American Medical Association,¹ that he has neither the time nor the necessary detailed knowledge of bacteriology, pharmacology, toxicology, endocrinology and other special branches of medicine to determine always which patients might have recovered without drug intervention, which preparations are unnecessarily complex, which preparations

contain agents that are incompatible, and which preparations may have lost part of their effectiveness because of partial absorption into the container or by oxidation and the host of other factors that must be considered. Without doubt this suggestion must be accepted. Fortunately practitioners of the English-speaking world have counsel on which they can rely in this matter. In America there is the Council on Pharmacy and Chemistry of the American Medical Association; in Great Britain there is the Therapeutic Trials Committee of the Medical Research Council. The activities of these bodies are not known as widely as they should be, and attention should therefore be drawn to two recent publications dealing with them.

From the statement already mentioned we gather that the Council on Pharmacy and Chemistry was organized in 1905 "to serve the medical profession and the public by providing accurate information on the status of agents used in the treatment of disease". The council consists of seventeen scientists, each of whom is associated with some recognized centre, and a secretary who is a full-time employee of the American Medical Association. Since 1905 sixty members have been appointed to the council and the average tenure of membership has been eleven years. Members serve without remuneration. The council not only deals with proprietary drugs; it also "reviews the status of other agents which the medical profession, and even the public, may be urged to use, publishes reports on claimed advances in the use of medicinal preparations, with the Chemical Laboratory elaborates standards on drugs introduced into materia medica, provides information for physicians, members of the armed forces and others, sponsors the publication of several books and numerous research projects, and maintains a cooperative relationship with many governmental and nonofficial organizations". The council does not hesitate to initiate an investigation when a grievous error occurs in the manufacturing and dispensing of drugs; it also maintains "cooperative relationships" with other countries. Every year the council issues a book, "New and Nonofficial Remedies", and products found acceptable are listed in this book. Articles are listed according to a set of rules.

The rules essentially provide that an accurate statement of composition must be provided; suitable tests must be available for identification; the article cannot be advertised either directly or indirectly to the public unless it is one of those agents information on which the Council feels may be made available to the public (for example, first aid measures, laxatives, vitamins); statements regarding origin and source of raw material must not be misleading; therapeutic claims shall not be exaggerated or misleading; the label must list the active substances; the name under which the product is sold shall not be misleading or suggestive of diseases or therapeutic indications; patent numbers and trade marks, if any, must be furnished and the preparation must not be unscientific.

The council offers no objection to the application of a proprietary, exclusive name, provided the drug to which it is applied represents something new. Such names are recognized "for products not previously known, for substances previously known but not used in medicine, for unique and worthwhile variations for making this drug available, and when a known substance is found to have a new value, even if that substance was used in the practice of therapeutics at an earlier date". During the past twenty years only eighteen articles have been rejected, primarily because the manufacturer has refused to abandon a proprietary name which was in conflict with the council's rules. Admission of an article to "New and

¹ The Journal of the American Medical Association, February 12, 1944.

Nonofficial Remedies" implies neither recommendation nor approval. It merely means that no conflict with its rules has been found by the council and that the product has merit as a therapeutic agent. The manufacturer is given an opportunity "to argue the council's decision" and may at any time ask for a reconsideration of a decision. Occasionally the council may make a kind of preliminary investigation and indicate what further work and study have to be carried out in regard to a promising product before it can be accepted. It should also be pointed out that a laboratory is maintained at American Medical Association headquarters and that the chemical composition of every product is examined before it is admitted to "New and Nonofficial Remedies". The secretary of the council, who is the author of the statement, remarks that it is refreshing to observe how a body with no legal power can create changes with far-reaching effects. From the few facts that we have set out the influence of the council is easily understood. Apart from the influence that it wields among the general public and practising members of the medical profession, the decisions of the council are of the greatest value to medical journals, their editors and managers.

The activities of the Therapeutic Trials Committee of the Medical Research Council of Great Britain are described by Dr. F. H. K. Green, a member of the council's administrative staff, in an article appearing in that valuable publication of recent origin, the *British Medical Bulletin*. Green shows how his committee provides a means for the clinical evaluation of new remedies in Great Britain. He shows that drug manufacturers in Great Britain are at a disadvantage when compared with manufacturers of some other countries on account of the reluctance of many British doctors to carry out clinical trials at the direct request of commercial firms, and especially to allow their names to be quoted as having made such tests. This was one of the reasons why the Medical Research Council in 1931, after representations had been made by the Association of British Chemical Manufacturers, created the Therapeutic Trials Committee. The committee was to be "a disinterested intermediary" between the manufacturers and the medical profession in regard to the arrangement of tests. Certain conditions are laid down for the acceptance of new remedies for trial. The first is that the applicant must disclose "all such details as are necessary for the understanding of the true composition and nature of the remedy submitted for trial". The council retains the right to disclose the relevant scientific details of the composition of a product in any report upon its clinical action which may ultimately be published. Products of unrevealed composition are not accepted. The next condition is that, once he has applied successfully for a clinical trial of his product to be made, the manufacturer has to undertake not to make any independent arrangement for its testing without the council's permission. In this way no conflicting or confusing report appears because of premature publication following trial in an inadequate series of cases. It also follows that new remedies are often tested before they are put on the market (the council is interested only in new products). When a product is accepted for trial, it is handed to a clinician of high standing. The council decides whether the report, favourable or unfavourable, shall be published or communicated to the manufacturer for his private information. If a report is published it

appears under the name of the clinician as "a report to the Therapeutic Trials Committee of the Medical Research Council", and the manufacturer is at liberty to refer to the report in his trade literature. Since the scheme was instituted in 1931 more than 40 new products have been accepted for clinical trial and reports on many of them have been published. Green contends—and most people will agree with him—that the majority of reports on clinical tests published under the authority of the Medical Research Council constitute substantial contributions to clinical research and that the manufacturer whose product is placed on the market with an official recommendation is in a much stronger position than if the tests had been arranged privately. The advantages to the community of an impartial body to carry out expert investigations of this kind are, of course, considerable.

Up to the present Australia has been able to rely on the results of investigations of new remedies undertaken in America and in Great Britain. During this war Australian activity in the manufacture of drugs has increased to an unexpected degree. New remedies will appear and new trade names will be added as time goes on. From the older American system and from the British procedure it would be possible to create a method of dealing with new preparations that would be applicable to Australian conditions. The National Health and Medical Research Council would be the body to undertake this work. In the meantime it is important that Australian doctors should know how these matters are handled abroad.

Current Comment.

THE MANAGEMENT OF MINIMAL PULMONARY TUBERCULOSIS.

For many years all those interested in the problems of pulmonary tuberculosis have preached the necessity for the earliest possible recognition of the disease, and have welcomed any advances in diagnostic methods which might further this end. Now we have a simplification of radiographic technique, namely, fluorography or miniature radiography, and it seems likely that this method will in the future be widely applied to the community in general. This has already introduced difficult problems of disposal. Increasing numbers of young persons will be found to show radiographic signs suggesting pulmonary tuberculosis. It is not enough to accept such evidence as proof, but it is obvious that established diagnostic criteria must be laid down. And then when it is proved that a certain proportion of these young people are suffering from active disease, the question of what is to be done with them remains. More difficult still is the question of the handling of the doubtful cases when proof of activity is not forthcoming, but when there are grounds for suspicion that a breakdown will occur. Among the considerable numbers of studies on mass fluorography is one by Surgeon Captain W. D. W. Brooks, who records the results of examination of nearly half a million of the male personnel of the Royal Navy and 23,000 of the Women's Royal Naval Service.¹ The term "minimal pulmonary tuberculosis" in this inquiry is taken to mean adult pulmonary tuberculosis of the reinfection type whose radiographic appearance suggests infiltration without demonstrable cavitation and of a small size accurately defined by the author. Of course, it is first necessary to be sure that the radiographic shadow is really cast by a tuberculous lesion. The methods used included assessment of the following evidence: history and physical examination,

¹ *The Lancet*, June 10, 1944.

study of the temperature, the pulse rate and the weight, blood count, the results of repeated blood sedimentation rate estimations, at least six direct sputum examinations including concentration methods, and if necessary at least three cultures of sputum or gastric juice. Sometimes guinea-pig inoculations were used in addition. This list sounds formidable, but on the average the answer was obtained in ten days. By this method 2,911 sailors were examined in whom fluorography revealed a minimal lesion in the lungs, and only in 16% of them was evidence of activity found. In 63% the lesions were thought to be inactive, though uncertainty was felt on their stability, while in 21% the lesions had all the characteristics of healed disease.

Amongst the women examined the percentage of active infections was eighteen. Brooks is sure that mere out-patient or dispensary observation is by no means sufficient for the investigation of these infections, for in one-third of those found to be active the necessary proof would not have been elicited by such means. Fluorographic studies have already shown that the proportion of arrested infections increases rapidly with age. This indicates that many of the apparently inactive infections ultimately become arrested without treatment. But Brooks points out that it is not correct to assume that the prognosis in all minimal infections revealed by radiographic investigation is equally good, for it is not known at the time of examination whether given infections will fall into the truly inactive group or not. Neither can these be compared with the favourable early types of case with which sanatorium practice has familiarized clinicians, for patients in this category had in most cases shown some signs or symptoms, and though this might not seem at first sight to be a favourable circumstance, it may be agreed that restriction of the size of the lesion over a definite period of time, even in spite of symptoms, makes it more likely that the process is proliferative and not rapidly exudative. Therefore it is very difficult to say confidently which patients need active therapy and which do not.

As Brooks remarks, it is important not to defer active treatment too long, and also not to create a destructive neurosis by over-caution. It will be agreed that when the process is believed to be inactive, examination at intervals will be sufficient, the intervals to vary according to the patient's age. The active lesion is, of course, an indication for bed rest, and any further appropriate treatment thereafter according to the individual needs of the patient, including artificial pneumothorax, if thought necessary or desirable. In the remaining two-thirds of the revealed subjects of slight pulmonary tuberculous infection the problem is less straightforward. The naval male patients in question were assigned to selected shore service in the south of England, where they lived in barracks on standard rations. They were allowed liberal leisure and leave. They were under frequent out-patient review, in the course of which they were examined physically, and the blood sedimentation rate was estimated and a radiogram was taken at intervals of three months rising to six months. Brooks gives figures showing the fate of these men during two years. It was found that the younger the patient, the more likely was he to present evidence of activity as time went on, and, irrespective of age, the longer the patient survived without evidence of activity, the greater was his chance of avoiding relapse. Of 1,826 men, 120 relapsed within six months, 58 within six to twelve months, twelve within twelve to eighteen months, and only one during eighteen to twenty-four months. Not all of these had actively progressive disease; in some cases all that could be said was that evidence of some activity became manifest.

A. Kahan and H. G. Close have also published an interesting analysis of 500 selected cases drawn from the series described by Brooks.¹ They make one interesting point, that when particular suspicion is felt on clinical and radiological grounds, even failure to demonstrate tubercle bacilli must not lull this suspicion. They further consider physical signs unimportant, an opinion with which few if any would disagree. They also mention a now well-known "catch", the occasional radiographic similarity between the

lesions of tuberculosis and atypical pneumonia. Further details need not be quoted here. It is hoped that wide surveys of the population will be made by fluorographic methods, but if this is done it will be imperative to have freely available entirely adequate facilities for exact bacteriological diagnosis. It is dangerous to accept unsupported radiographic evidence of pulmonary tuberculosis, at least in its lesser manifestations, and activity is difficult and often impossible to assess by these means alone. It is evident therefore that it is not too early for campaigning to begin, for even if the mechanism were ready today for detection of minimal lesions in all classes of people, the information thus gained would be of little value because only a fraction of the necessary accommodation and equipment for adequate treatment is available.

HEADACHE AND HISTAMINE.

No doubt the sufferer from severe headache would be impressed if he were told that his malady was "histaminic cephalalgia". This name is used by Lieutenant-Colonel E. L. Lieder in an article on the type of migraine believed to be due to vascular disturbances associated with vasodilatation.¹ Lieder quotes Horton and others who reported in 1939 that it was possible to recognize a form of migraine of this kind and to relieve it by treatment with histamine. As a small dose of histamine usually reproduces an attack, this treatment apparently belongs to the time-hallowed method of the "hair of the dog that bit", known to modern immunologists as desensitization. It is perhaps doubtful if full desensitization is accomplished, but the results suggest that such therapy, like other similar methods used in the control of the allergic complaints, is followed by relief in a number of cases. The leading features of this so-called histaminic type of migraine are the absence of a familial history, an onset relatively late in life, the frequent occurrence of severe, short attacks, without aura and without sequels such as vomiting, but with an associated congestion of the eye and perhaps the temporal vessels on the affected side, for it is unilateral in distribution. Injection of 0.1 to 1.2 milligrammes of histamine usually reproduces an attack, and adrenaline relieves it. It is claimed that small repeated doses of histamine, beginning at 0.05 milligramme, will prevent further attacks.

Lieder considers that the clinical picture is a clear one, which is an important point, for if there is to be practical value in thus subdividing the migrainous subjects, it must depend on something simpler than a full allergic investigation. He points out that migraine is usually characterized by a strong hereditary background of migraine or else of some allergic condition such as asthma or urticaria, and has a well-marked periodicity. In general its age incidence is usually early, that is, the first manifestations often occur as early as the second decade of life. The exact relationship of migraine of this more or less hereditary type with food or other allergies need not here be further pursued.

Lieder analysed 52 sufferers from migraine, and comments on the features, investigation and treatment of their malady. This series of 52 formed part of a larger series of 72 consecutive patients who were studied in a single clinic from an allergic standpoint. All these patients suffered from headaches. Only four were considered to be examples of the histamine-sensitive variety, and this confirms the experience of others who have found that this variant of migrainoid headache is uncommon. The remaining fifteen patients in this series had miscellaneous causes for the headaches that constituted their presenting symptoms, such as anxiety states and hypertension. Though the hope that a severe hemicrania may be resolved by a course of histamine injections is not often realized, a number of observers have had successes. Therefore, it is worth while to think of this syndrome in cases of a relevant type, with a view to applying the appropriate remedy. It is, of course, necessary to remember that severe symptoms may be caused by the incautious use of histamine.

¹ *The Lancet*, May 20, 1944.

¹ *Annals of Internal Medicine*, 1944.

Abstracts from Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Drug-Resistant Bacteria in Vitro.

J. MCINTOSH AND F. R. SELBIE (*The British Journal of Experimental Pathology*, December, 1943) have studied the production of drug-resistant cultures of bacteria *in vitro* and their interrelationship. They used 1/5 strength meat broth containing 1% peptone and 0.2% glucose and 1% horse serum and added a constant inoculum of less than 1,000 organisms. The test period of incubation was forty-eight hours for streptococci. Ordinary broth, eighteen hours of incubation and the same small inoculum, were used for the staphylococcus. Five-fold dilutions of drug were used in the sulphonamide series, two-fold with the other drugs. Successive titrations of the organisms were made, and at each step inocula were taken from the tube containing the highest amount of drug in which growth had occurred. After six serial passages a hemolytic streptococcus was trained to withstand 600 times as much sulphanilamide as at the first transfer. A final titration was made one year later, and showed that this induced resistance was still present. A staphylococcus was trained to resist the effects of sixty-four-fold increase of propamidine and penicillin, and a sixteen-fold increase in proflavine. Cross resistance could be demonstrated against other members of the sulphonamide group, and between two members of the acridine group. Other members of this group maintained their bacteriostatic effect. Double resistance can be induced, one training being followed by a second. Conversely, the resistance acquired does not appear to be lost.

Purification of Influenza Virus.

W. M. STANLEY (*The Journal of Experimental Medicine*, March, 1944) has studied the purification of influenza virus. Differential centrifugation in a vacuum or a Sharples type machine was found to give the best results. Methods beginning with absorption and elution from the avian red cells, either adult or embryonic, led to the inclusion of considerable amounts of non-virus protein. The author recommends the use of the Sharples machine for the large-scale preparation of virus, and points out the uncertainty which still exists regarding the exact size of the virus particle.

The Size of Influenza Virus.

W. M. STANLEY (*The Journal of Experimental Medicine*, March, 1944) has attempted to estimate the size of the influenza virus particle by differential centrifugation, using as controls a series of viruses of known size. The electrolyte suspending fluid was found to be important, and to exert considerable influence in producing reliable duplicate estimations. Finally by the use of a sucrose density gradient this was achieved, and duplicate readings were obtained. It was found that the virus particle sedimented at a rate comparable with particles of 70 milli-

microns, though a fraction of substance 10 millimicrons in diameter could be recovered constantly. The infectivity of this latter fraction was extremely low, and the author concludes that the true infective virus particle probably has a size of about 70 millimicrons.

Laboratory Aids in the Diagnosis of Malaria.

ERIC DENHOFF AND BERNARD C. PIPER (*The Journal of Laboratory and Clinical Medicine*, May, 1944) discuss laboratory aids in the diagnosis of malaria and describe a method of preparing thick and thin films on a single slide. The rapid method of Field is adopted for the staining of the thick film, and a very slow double method with the use of Wright's and Giemsa's stains for the thin film. The authors describe a rapid qualitative test for "Atebrin" in urine to be used when small amounts have not declared their presence in other ways, and when it is desired to ascertain whether the drug is being absorbed and excreted.

A Test for Hypersensitivity to Sulphonamides.

W. B. LEFTWICH (*Bulletin of the Johns Hopkins Hospital*, January, 1944) has devised a test for hypersensitivity to sulphonamides. He collected serum from human subjects who had been receiving sulphonamide therapy for not less than eight days, who gave negative results to cultivation of the blood and to serum tests for syphilis, and in whom the blood sulphonamide level was above 2.0 milligrammes per centum. This serum was stored aseptically without preservative, and used as antigen. Of the test serum 0.05 ml and of normal serum 0.05 ml were injected intradermally on the flexor surface of the forearm. In reacting patients a wheal 6.0 to 17.0 millimetres in diameter developed within twenty minutes at the site of injection of the test serum, with a large surrounding erythema. This faded in two hours, and there was no delayed reaction. A note of warning is sounded, that if the control serum is not fresh, a wheal might also be produced with some samples. The author believes that the test is practicable and reliable for testing the reaction of a patient to sulphonamide drugs.

Sulphonamide-Resistant Pneumococci.

MORTON HAMBURGER, L. H. SCHMIDT, CLARA L. SESLER, J. M. RUESEGOER AND EDA S. GRUPEN (*The Journal of Infectious Diseases*, July-August, 1943) have investigated the occurrence of sulphonamide-resistant pneumococci in clinical practice. They recognized the importance of media containing sulphonamide inhibitor and of dosage of organisms, and adopted a standard technique of titration of sulphonamides in a medium of constant composition. They classed as sensitive those organisms which would not grow in a concentration of more than 2.5 milligrammes per centum of sulphonamide, as resistant those which would grow in the presence of 40.0 milligrammes per centum, and as moderately resistant those which would multiply in a concentration of between 10.0 and 20.0 milligrammes per centum. They used as inoculum 100 to 2,000 organisms, and incubated their cultures for forty-eight

hours. The procedure gave readily reproducible results, regardless of the method of primary isolation of the organism, from blood or sputum, by plating out or mouse inoculation. Four strains of organism were classed as resistant during the course of the patients' illnesses, and one of the patients died. Sixty patients from whom 393 different isolations of pneumococci were made showed no alteration of sensitivity, while six patients gave cultures of varying sensitivity. The authors believe that the average duration of treatment is not sufficient to produce marked alterations in the reactivity of pneumococci to sulphonamides, and that the development of resistant organisms is not a great hazard in the routine treatment of pneumonia due to the pneumococcus. Three patients undergoing prolonged therapy showed significant increases in reactivity, and organisms were constantly recovered from the blood stream. In some instances in which investigations were carried out at considerable periods of time after cure, it was found that pneumococci just as sensitive as those originally isolated could still be found in the same patient.

Serological Diagnosis of Relapsing Fever.

GEORGE J. STEIN (*The Journal of Experimental Medicine*, January, 1944) has studied the serological diagnosis of relapsing fever, in order to assist the identification of a fever in which symptoms are often atypical. Infection of laboratory animals provided a source of spirochaetes, and heavily infected blood was treated with saponin and washed carefully four times in merthiolated physiological saline solution; the resultant suspension of spirochaetes was used as an antigen for agglutination and complement fixation tests. Serum from a variety of animals and man, normal serum, and serum from other diseases and from relapsing fever patients were used. The antigen reacted with animal serum obtained after infection with a variety of types of the organism, but not with convalescent serum obtained from diseases other than relapsing fever. The agglutination test was simpler to perform than the complement fixation test. The antigen appeared to be stable over a period of at least four months, and the author believes that it could be used in the diagnosis of the human disease.

HYGIENE.

Psychology and Industry.

ALICE M. STEWART (*The Journal of the Royal Institute of Public Health and Hygiene*, June, 1944) reports the results of an experiment in which 44 women students and 18 men students from universities spent periods varying from four to eleven weeks working in a factory. The object of the investigation was to study the pathological effects of a certain industrial poison, and the students were all volunteers. They knew that they were facing some discomfort and possibly illness; but they all felt that by their cooperation they were doing something worth while. The most interesting results of the experiment were on the psychological side. The students became

popular with the workers and the workers with the students; friendships were made between them. In order to forestall any possibility that the students might become bored and fall out before the investigation was completed, they were asked to write reports on any aspects of factory life that specially interested them. In these essays, produced by people not necessarily more intelligent than the factory workers, but with trained powers of observation and no hampering fear of unemployment to prevent them from being completely frank and outspoken, certain valuable technical improvements were suggested. Even more valuable were the comments on causes of irritation and dissatisfaction on the part of the workers. The author stresses the need for "channels of expression" between the workers and the management of large factories; in old-fashioned smaller concerns the relationship between the workers and the management is necessarily more personal. She states four factors which are essential to the maintenance of a healthy psychological atmosphere in an industrial organization: (i) The workers must have some means of self-expression. (ii) They must have a leader and a definite purpose in their work which they can understand and in which they can take some pride. (iii) Certain among them need to feel that they have some chance of distinction and advancement. (iv) The worker must be free from anxiety and a perpetual sense of drudgery. The only way to achieve these aims is first of all to establish healthy physical conditions of work, and then to develop an organized social group in a peculiar and effective relation with its supervisors. It is clear that in large industrial firms the second aim cannot be satisfactorily achieved without a much closer and more scientific study of the problem.

Transmission of Glanders from Horse to Man.

C. D. MCGILVRAY (*Canadian Journal of Public Health*, July, 1944) states that, although glanders is essentially a disease affecting horses, mules and donkeys, human beings are susceptible to it. Glanders was widely prevalent as a disease among horses in Canada until 1915; since then the disease has been suppressed, and at the present time it is entirely eradicated. It still prevails in some parts of Europe, Asia and Africa. The prevalence and distribution of glanders have always increased during and after all great wars; this observation may hold for the present war. The cause of the disease is the *Pfeifferella mallei* (*Bacillus mallei*), which is present in the nasal discharges and suppurative discharges from the pustules and ulcers (farcy buds) which develop on the skin, especially that of the legs. Glanders can be with certainty diagnosed by the mallein test, even when the infection is latent. Treatment of glanders in the horse is not permitted in Canada. All reactors to the mallein test must be immediately slaughtered and their carcasses properly buried or cremated; stables and yards occupied by affected animals must be cleaned and disinfected; contact horses must be kept under observation; any additional reactors to the mallein test must be slaughtered. The author reports two

cases of glanders in man; one occurred in 1905 and the other in 1906. Both patients died, one seventeen days and the other twelve days after infection. A full description of the clinical findings is given. The author stresses the fact that, in view of the danger of infection, post-mortem examination of affected horses should be undertaken only by trained persons and with proper precautions.

Influenza and Similar Respiratory Infections in a Military Camp.

R. HARE, J. HAMILTON AND W. R. FRASBY (*Canadian Journal of Public Health*, October, 1943) have carried out a study of influenza and similar respiratory infections over a period of three years. In a large military camp the febrile patients admitted to hospital were intensively studied; the studies included blood tests for antibody and the making of virus cultures. In 1940 influenza A was alone isolated. In 1941 neither A nor B virus was found. In 1942-1943 three epidemic waves were noted. The first was accompanied by a primary atypical pneumonia not due to bacteria, though neither A nor B virus was found. After about five weeks' interval a second wave of an atypical infection with profuse rhinorrhoea occurred. As in the first wave, about one in four patients had pneumonia. Evidence of both A and B influenza viruses was found, and mainly B. These waves lasted for about two months and one month respectively. Nearly two months later came a third wave lasting only fourteen days, due apparently to influenza A virus. This circumscribed epidemic limited to the hospital in a crowded camp is unusual. It was quite distinct from the first two waves. In these former waves the common colds, febrile catarrh, influenza and atypical pneumonia in each wave all had, independent of severity, a common causative agent, whether influenza B or some unknown agent.

An Experiment in Tuberculosis Control.

J. V. RICHES (*Canadian Journal of Public Health*, October, 1943) reports an experiment in tuberculosis control. At Geraldton, in Ohio, a town of gold miners, it was decided to use the X-ray facilities of the silicosis division to examine not only the miners, but all families of new employees. A house to house canvass by Red Cross workers obtained assent in all but five families. Among 1,429 persons examined by X rays, 26 or 1.8% had pulmonary tuberculosis. Three patients had active infections and were sent to a sanatorium; in 23 instances the disease was arrested or healed. In addition 28 patients had a non-tuberculous lung condition. Twenty (77%) of all tuberculosis found was previously unknown. The cost per head was about 50 cents each. The value of a community survey is stressed.

MEDICINE.

Syphilitic Electrocardiographic Patterns.

SEYMOUR L. COLE AND ANNE BOHNING (*The American Journal of the Medical Sciences*, March, 1944) analyse the

electrocardiograms and post-mortem findings in thirty cases of cardiovascular syphilis. All the hearts and aortas were found to be abnormal at post-mortem examination; in eight cases the anatomical findings and resulting electrocardiograms were entirely on a syphilitic basis; in eleven other cases syphilitic anatomical abnormalities were combined with those of other aetiological factors to produce the electrocardiographic pattern; and in the remaining eleven cases syphilitic lesions were present as coincidental findings, the electrocardiographic contours being ascribed to the non-syphilitic lesions. No specific pattern was found to be pathognomonic of syphilitic cardio-vascular disease, but two specific patterns occurred frequently and were due in whole or in part to syphilis. The frequency of left ventricular preponderance and anterior wall infarction patterns was greatest when syphilis only was present. Uncomplicated syphilitic aortitis, *per se*, and uncomplicated aneurysms caused no electrocardiographic abnormalities, aortic regurgitation produced left ventricular hypertrophy reflected by various types of left ventricular preponderance in the electrocardiogram, coronary ostial stenosis in some instances caused myocardial fibrosis which had no specific electrocardiographic pattern, and stenosis of the mouths of the coronary arteries was shown to contribute to the formation of cardiac hypertrophy, especially of the left ventricle, resulting in left ventricular preponderance patterns in the electrocardiogram. When localized areas of the myocardium were deprived of their blood supply by coronary ostial encroachment, corresponding specific infarction patterns were present in the electrocardiogram, and these were all of the anterior wall type in this series. When the septum and conducting system were similarly deprived of their blood supply, the electrocardiogram showed auriculo-ventricular and intraventricular block. The authors state that while the absence of electrocardiographic change does not exclude cardio-vascular syphilis, in most cases of far-advanced syphilis abnormal electrocardiograms are given.

Heart Failure in the Aged.

T. A. HOWELL (*British Heart Journal*, January, 1944) has described the causes and forms of heart failure in seventy-five old persons. He found himself unable to determine the cause in ten cases, even after repeated clinical examination. He holds that there is something to be said for the label "myocardial degeneration" in these cases. High blood pressure was the commonest cause of heart failure in the series. More than half of those with high blood pressure died with congestive failure; about a third died with progressive cerebral ischaemia (the signs of which are a gradually falling blood pressure associated first with mental confusion, then with restlessness or violence and then with coma and death); and some died with myocardial intoxication due to infective disease such as pneumonia. In the patients with congestive failure the right ventricle was affected as often as was the left; this suggested that the high blood pressure was not the sole cause of the heart failure.

British Medical Association News.

MEDICO-POLITICAL.

AN ADDRESS.

At a convention of the New South Wales Branch of the British Medical Association, held at British Medical Association House, 135, Macquarie Street, Sydney, on Friday, September 8, 1944, the opening address was given by Sir Charles Blackburn. Dr. G. C. Willcocks, the President, introduced Sir Charles Blackburn, who spoke in the following terms.

Though fully aware that it was a signal mark of confidence and a great honour to be asked to deliver the opening address this morning, I accepted the invitation with considerable hesitation because I realized that I was shouldering a very grave responsibility in possibly influencing your decisions on questions involving the whole fabric of medical practice that has been built up over hundreds of years.

You will have before you a proposal of the Commonwealth Government to provide a nation-wide medical service without any cost to the individual, except in so far as he contributes to the general revenue, and you will have to decide whether in your opinion it would be possible on that basis for the profession to render to the public as efficient a service as it does at present, and if so, on what terms and conditions. I think it is important that in approaching your problems you should be reminded of what took place at the convention that met in this hall early last year, and be presented with a short summary of what has taken place in regard to the profession's relationship with medical planning since that date.

Those of you who attended the previous convention will recall that there was no government proposal before the meeting and that the debate centred mainly about a scheme which had been submitted by a subcommittee headed by the Director-General of Health, Dr. Cumpston, to the National Health and Medical Research Council in 1941 as "an outline of a possible scheme for a salaried medical service".

It is relevant to the present discussion to recall that the preamble attached to the scheme by the National Health and Medical Research Council states that the Council is of opinion "that the scheme outlined provides a basis for discussion with representative members of the practising medical profession in Australia; and that such discussion is essential for the correlation of differing but sincerely held points of view". It was in anticipation of an invitation to such a discussion and because it was understood that the members of the Federal Council would be called into consultation with the Parliamentary Joint Committee on Social Security that the delegates representing the various sectional interests in the profession had met together to consider the position that had arisen and to inform the Federal Council as to what attitude they thought should be adopted.

After full debate the delegates decided by a large majority that on the basis of the scheme outlined by the National Health and Medical Research Council, the general health of the public would not be so well cared for as at present, and this view, along with alternative practical suggestions, was embodied in resolutions for submission to the Federal body. When similar conventions had been held in the other States the profession could justly feel that though it had not yet been invited to meet the Government or the National Health and Medical Research Council, it had shown the utmost willingness to do so, and in anticipation of such meetings had been at great pains to inform its Federal representatives of the "sincerely held point of view" of a very wide cross section of its members. There was no secrecy about these proceedings and they were fully reported in *THE MEDICAL JOURNAL OF AUSTRALIA*.

When we turn now to subsequent happenings, it may first be recorded that the preliminary discussion regarded by the National Health and Medical Research Council as essential did not take place, though Sir Henry Newland intimated his wish that it should. As to why it did not, I can only quote the rather cryptic explanation given by Dr. Cumpston on December 8, 1943, to Mr. Barnard, M.P.: "It is true that I agreed with Sir Henry Newland to endeavour to obtain a conference between our Council and his Council. For reasons which I need not go into now—I submitted them to my Minister and ultimately to the Prime Minister—that recommendation was not adopted." This decision had created the extraordinary position that though the profession was aware that the Minister of Health and his official

medical adviser had under consideration a scheme for bringing about revolutionary changes in medical practice, it was denied an opportunity of discussing it even though the National Health and Medical Research Council regarded this as essential.

There was a fleeting hope of some interchange of views taking place between the two bodies when the Chairman of the Parliamentary Joint Committee on Social Security arranged a conference on health services in Canberra on December 8 and 9, 1943, between his Council, six members of the National Health and Medical Research Council, the Directors-General of Defence Medical Services, the Social Security Medical Survey Committee, and six representatives of the practising medical profession selected by Sir Henry Newland. When the meeting opened, however, the hope was promptly dissipated, for Dr. Cumpston, who attended, announced that for some technical reason involving parliamentary procedure the other members of the National Health and Medical Research Council would not be present. This might have been very unfortunate from our standpoint, since had any decisions come before Parliament conflicting with the Council's scheme, it would have been open to any member to call attention to the fact that the Council had not taken part in the discussion.

The conference took place in a very cordial atmosphere under the able and courteous chairmanship of Mr. Barnard, who said in his introductory remarks: "The friendliness and cooperation of those members of the medical profession with whom the committee has come in contact, and particularly Sir Henry Newland and his colleagues, have been most helpful throughout the inquiry."

It was decided to discuss the less controversial matters first, and by the time agreement had been reached on these, it was evident that there was not sufficient time left to debate the more contentious questions, so a small medical planning committee of eight was appointed to try to thrash out the major points at issue and present a plan for a "comprehensive health service" to a subsequent meeting of the full committee.

This Medical Planning Committee met in Sydney at the end of February this year, and after keen but very friendly and cooperative debate it unanimously adopted a report covering some forty odd foolscap pages of typescript. Outstanding features in this report were urgent recommendations for immediate attention to such pressing matters as housing, child welfare, pulmonary tuberculosis, improved hospital facilities, more accessible ancillary sciences, and improved medical services for less populous areas. The committee did not advocate any revolutionary changes in general practitioner service, but suggested how improvements might be made in such specified aspects as specialist facilities in remote areas, decentralized out-patient clinics, and group practice, and indicated that particular schemes might well be tried out in limited areas.

As it seemed reasonable to hope that a report sponsored by a very representative subcommittee headed by the chairman would be adopted by the full committee, and, if accepted by the Joint Committee, submitted to Parliament, four representatives were naturally gratified to feel that the profession would at last have its opportunity of publicly demonstrating its general willingness to cooperate in health planning and at the same time of presenting its sincerely held views on controversial aspects. However, they had wasted their time in forgoing from the four corners of Australia, since for some mysterious reason the full committee was not called together and so the report of the Medical Planning Committee lapsed, indeed became so completely a dead letter that though it was set up in type ready for printing in your medical journal, you have not had an opportunity of reading it as the Director-General of Health vetoed its publication.¹

The next contact followed the receipt of a letter from the Federal Minister of Health dated June 16, 1944, stating that at the meeting of the National Health and Medical Research Council on May 25 a resolution was passed recommending to the Government that a conference be called at Canberra consisting of that Council, the Federal Council of the British Medical Association and representatives of the Royal Australasian Colleges of Physicians and Surgeons to discuss improvements in the medical service to the people. The letter went on: "I feel sure that you will agree that such a conference with representatives of the Government will be profitable. It has been decided to invite the bodies mentioned to meet in conference with the Hon. the Treasurer and myself with the object, if possible, of arriving at agreement as to the form which improved medical services to the people might take."

¹ This report was published in the issue of September 9, 1944.

This naturally led us to believe that everything was still in the melting pot and that we were to take part in a general discussion out of which a definite plan would take shape, and we were therefore very surprised when in opening the meeting, Senator Fraser, after very cordially welcoming those taking part, said: "The Government intends that every citizen shall have available the highest grade of medical service, without cost to himself or herself, other than such general contributions as may be made through general revenue channels." "Discussions"—I would have you note this—"have been proceeding for nearly three years, but the principal issues have not yet been determined." Something more than surprise was registered when Mr. Chifley followed with some more forthright and less cordial remarks, a few of which may be quoted: "I say quite frankly that I have been disappointed at the failure to arrive at some form of agreement in regard to medical benefits." "As a responsible Minister of the Cabinet I inform the conference that a plan has been laid down." "The stumbling block to the implementation of this plan would appear to be reluctance on the part of the medical profession to cooperate with the Government." "The Government intends to go on with its plans. I hope that it will receive from all members of the community, irrespective of their political colour, what any government could reasonably expect, cooperation in the achievement of its objective." Later he referred to students receiving subsidies for their university courses and stated that after the war the quota of these would probably be increased and added: "Out of this pool will emerge a considerable number of medical graduates, who, after the war, will be pledged to give their service to the Commonwealth Government for a period of years."

These introductory remarks caused your representatives some consternation, first, because they were confronted with a plan that had not yet been submitted to the general body of members and so were not in a position to discuss it on your behalf, secondly, because they were simultaneously confronted with a plan and an accusation that they were refusing to cooperate in it.

The reference to political colour was rather startling, since the Director-General of Health could obviously have assured Mr. Chifley that the British Medical Association was in no sense a political body—indeed, he could have reminded him that it had only a few years ago opposed the National Insurance Bill brought in by Mr. Chifley's political opponents.

As regards the subsidized students, I have always felt that the otherwise admirable gesture of the Federal Government of providing financial assistance to impecunious scholars to enable them to attend the universities was marred by denying them the freedom of action after graduation enjoyed by their more affluent colleagues, but I was extremely sorry to learn that the Minister regarded them as a pool on which to draw for what industrial unionists call "blacklegs" if the profession proved uncooperative.

At this stage Mr. Chifley withdrew, as he had to attend an important meeting, and a general discussion developed, but as the plan had not been submitted to the profession, your representatives were at rather a disadvantage in discussing how it should be implemented. Chief matters discussed were control of the scheme about which the Minister was very non-committal, free choice of doctor and doctor-patient relationship in a salaried or fee-for-service scheme. It was very evident that the public health officers who spoke very strongly in favour of a salaried service and attached little significance to the free choice of doctor, apparently on the rather illogical ground that as a great many people, however much they wished it, had not a free choice at present, those who had might as well be deprived of it.

When time was running out and it was obvious that no commitments could be made by your representatives, Mr. Fraser suggested that it might help if the conference were to appoint a select committee to go into the details of a scheme that would be acceptable to all parties. As it was obviously desirable that if the government plan was to be implemented the profession should avail itself of any opportunity it was offered of making known its views and trying to secure that the public should suffer as little as possible from the disruption of the present service, Sir Henry Newland agreed to the suggestion, and later, after consultation with the other members of the Federal Council, announced that a committee of six representatives of the British Medical Association would be appointed on the basis of one from each State.

This brings us up to this meeting today, to which you have been called to consider the new position and to advise the Federal Council as to the steps you think should be

taken to meet it. The conditions, as I have already said, are very different from those confronting the delegates at the last convention when they had before them a rather nebulous scheme. Today you have before you the foundation of a government plan, which, however built on, must so completely revolutionize the whole structure of medical practice as it exists today that the intimate doctor-patient relationship on which it is based will almost inevitably be destroyed.

So far as is known to your Council, the Government in planning these drastic changes in the field of curative medicine neither sought nor received advice from any accredited representative of those practising it, but had as its sole adviser the Director-General of Health, whose very important duties cover an entirely different health service from that of the doctors for whom the Ministry was legislating. For this the Director-General apparently was not responsible, as he would appear to have done his best to have the profession consulted, for he is chairman of the National Health and Medical Research Council, and in the memorandum read on December 8, 1943, we find: "The Council has always advised that, before any decision is reached, full discussion should take place between the Commonwealth Government and the medical profession. Without the active and willing cooperation of that profession no system can succeed. In view of the stage to which in its evolution this matter has advanced, the Council suggests that it would be wise for discussions to take place direct between the Government and representatives of the profession."

This is a most important statement, for it indicates: (i) That the chief adviser to the Minister urged him to consult representatives of the profession. (ii) That he advised that the discussions should be direct—not as a small deputation at a plenary session of the National Health and Medical Research Council presided over by the Minister. (iii) That the Council has always, before December 8, 1943, advised that full discussions should take place before any decision was reached. Had that advice been adopted, the position would have been more in keeping with what has taken place in Great Britain where the Government in the early stage of medical planning invited representatives of the British Medical Association and other medical organizations to round-table discussions, and disclosed to them their objectives and invited suggestions as to how to carry them out. The Minister of Health announced that following on these preliminary talks a white paper would be issued giving a general indication of the plan it was proposed to adopt, but that this again would be open to free discussion and that he would not close the door to any constructive suggestions that did not vitally impair the whole scheme.

But as the advice of the National Health and Medical Research Council was not adopted, your Council feels that if you honestly consider that a mistake is being made, you should say so and even at this late hour submit to the Government the views that you would have put forward if the direct discussions recommended had taken place.

In my opening address to the convention held last year I said: "I would especially stress the fact that this occasion has afforded you an exceptional opportunity to demonstrate unmistakably that your guiding principle in formulating a health policy is that it should be one that in your carefully considered opinion is best fitted to establish and maintain the health of the nation at its highest possible level." I feel that I can give you no better advice than that today.

You will be asked to indicate very clearly your views as to the importance of preserving in any plan of service the principle of personal contractual relationship between patient and doctor, and also that of providing the greatest possible freedom of choice of doctor. As those who have the Minister's ear hold these principles of little account, it is clearly urgent that he should know the views of the general profession as soon as possible.

For my part I am ever more impressed with the importance of the psychological factor in the treatment of disease, and as in more than 50% of those who seek medical advice the background is psychic, and organic disease is either entirely absent or of minimal importance, I would very greatly deprecate any change that would sever the personal tie between patient and doctor. It appears impossible to preserve it in a salaried service with its roster of doctors, working eight hourly shifts, entailing in the case of serious illness visits to the same patient of perhaps two or even three different doctors in the twenty-four hours.

A fee-for-service plan might maintain the principle reasonably well, except that mutual exasperation over filling in of countless forms might disorientate both parties to the contract.

It is curious that a contributory scheme has not been suggested, for if the present system must be changed, a

carefully worked out contributory scheme could be planned to incorporate both the principles we have been considering. The public are, of course, quite used to such schemes which are largely in vogue in New South Wales, and one of the more recently established ones—the Metropolitan Hospitals Contribution Fund—has quickly secured a very large membership.

The objection that contributions would be constantly falling into arrears through temporary unemployment of contributors is answered by the announced proposal to provide for unemployment pay in post-war plans, since all that would be needed would be provision to pay out the contribution as well so long as the payments were being made.

The group practice system advocated by the Federal Council met with a very favourable reception by the Planning Subcommittee of the Parliamentary Joint Committee on Social Security, and if evolution could replace revolution in the Government's plans, this, along with the various other plans discussed, could be tried out in selected areas, and a final decision as to general policy deferred till it could be based on the results of the experiments. There is so much that needs urgent attention in the other fields enumerated by your Council that attention could be very profitably concentrated on them while these trials were being made, and in the meantime the general practitioner service, except in the selected areas, proceed on established lines. In any case it would seem that nothing but chaos would result from an attempt to introduce a salaried service abruptly, even if it had the approval of the general body of the profession. The manpower problem would alone present an insuperable difficulty, since in any circumstances many practitioners would elect to continue on in private practice, while on the other hand many more doctors would actually be required to service a system run on public service lines with regular set hours of duty than are needed in the present round-the-clock arrangement.

These, then, are some of the matters that I recommend to your consideration and debate in the hope that your point of view may present itself favourably to those who are planning your future for you.

You must not forget, however, that if the Government proceeds with its plan, it is important that the committee appointed in Canberra should know your views as to how the plan can be developed so as least to disrupt the doctor-patient relationship.

You must keep in mind also that though the conditions proposed may be such that the profession as a whole will stand aloof, there are some whose temperament inclines them to the choice of the ordered life of public service rather than to the hazards of individual endeavour, and there are those others whom Mr. Chifley suggests may have no choice at all. In the interests of these, your committee should be urged to do their utmost to prevent their directed lives from being hedged about by such harsh inflexible penal clauses as appear in the *Pharmaceutical Benefits Act*.

ANNUAL MEETING OF DELEGATES OF THE AFFILIATED LOCAL ASSOCIATIONS OF MEMBERS WITH THE COUNCIL OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

The annual meeting of delegates of the local associations affiliated with the New South Wales Branch of the British Medical Association was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on Friday, September 8, 1944. Dr. G. C. Willcocks, O.B.E., M.C., the President, in the chair.

The following is a list of delegates of local associations appointed to be present: Dr. E. P. Dark (Blue Mountains District Medical Association), Dr. R. A. Robertson (Border Medical Association), Dr. A. E. Panting (Broken Hill Medical Association), Dr. H. A. McCredie (Canterbury-Bankstown Medical Association), Dr. R. G. Woods (Central Southern Medical Association), Dr. O. J. Ellis (Central Northern Medical Association), Dr. G. N. M. Aitkens (Central Western Medical Association), Dr. S. G. Nelson (Eastern Suburbs Medical Association), Dr. N. E. McLaren (Eastern District Medical Association), Dr. L. W. Wing (Far South Coast and Tablelands Medical Association), Dr. G. F. Elliott (Illawarra Suburbs Medical Association), Dr. Cawley Madden (Kuring-gai District Medical Association), Dr. A. G. Brydon (Northern District Medical Association), Dr. J. R. Ryan (North Eastern Medical Association), Dr. N. F. Benjamin (Southern District Medical Association), Dr. A. L. Castleberg (South Eastern Medical Association),

Dr. C. H. Jaede (South Sydney Medical Association), Dr. J. Mutton (Warringah District Medical Association), Dr. S. R. Dawes (Western Medical Association), Dr. R. J. Waddington (Western Suburbs Medical Association).

The following were the members of the Council: Dr. G. C. Willcocks (President), Dr. A. J. Collins (Honorary Secretary), Dr. George Bell (Honorary Treasurer), Sir Charles Blackburn, Dr. G. M. Barron, Dr. K. S. M. Brown, Dr. A. M. Davidson, Dr. L. A. Dey, Dr. B. T. Edye, Dr. H. R. R. Grieve, Dr. Marie Hamilton, Dr. P. L. Hipsley, Dr. R. Jeremy, Dr. J. K. Maddox, Colonel A. M. McIntosh, Dr. K. S. Parker, Dr. W. F. Simmons, Dr. A. C. Thomas, Dr. E. A. Tivey, Professor H. K. Ward.

Dr. J. G. Hunter (Medical Secretary) and Dr. Hugh Hunter (Assistant Medical Secretary) were present.

The Editor of THE MEDICAL JOURNAL OF AUSTRALIA attended.

Welcome of Delegates.

Dr. G. C. Willcocks, the President, welcomed the delegates. He referred to the importance of the gathering and explained that in accordance with the usual custom voting would be by delegates only and not by members of the Council.

Minutes.

The minutes of the previous meeting of delegates of October 1, 1943, copies of which had been sent to local associations and members of the Council, were taken as read and confirmed.

Constitution of the Branch Council.

Dr. J. R. Ryan moved and Dr. S. G. Nelson seconded the following motion:

That this association considers that medical practitioners in Australia should provide for representation on State Councils on a regional basis.

Dr. R. A. Robertson said that he had discussed this matter with members of his local association. He thought that such a move was inadvisable; unless city men were chosen to represent country areas. Men from local associations in country areas would seldom be able to attend Council meetings and some would never be able to attend. In any case the time was inopportune for such a move. He therefore moved as an amendment that consideration of alterations in the constitution of the Council should be deferred until the end of the war.

Dr. A. L. Castleberg seconded the amendment and expressed the opinion that conditions would change after the war.

Dr. O. J. Ellis supported the amendment and said that so far anything of the kind proposed had been impracticable.

Dr. H. R. R. Grieve opposed the amendment and hoped the delegates would pass the original motion. He thought that the present representation should be extended, though at the same time he agreed that there was nothing wrong with the present method. Something more than a capacity to represent an area was needed in Council members. This would become more obvious as time went on—bigger and bigger brains would be needed. The present method had given useful men, the work was well done, and a high tone was always maintained. There were men in the country who would be an asset to the Council. In his opinion members should be added from outside the metropolitan area.

Dr. G. F. Elliott said that his association was in favour of some move such as that mentioned, though there was no dissatisfaction at present. Increased representation would give the Council greater power to initiate changes; it would also compel local associations to have a policy of their own.

Dr. Cawley Madden said that the present was no time even to discuss such a proposal. They should wait until the war was over.

Dr. N. F. Benjamin supported the amendment, but Dr. A. G. Brydon said that the proposal was excellent in theory, but should not be considered at present.

The amendment was carried; it was also carried as the substantive motion.

The President ruled that subsequent motions on the business paper standing in the name of Dr. C. H. Jaede and setting out in detail certain changes, would lapse in view of the meeting's resolution.

Medical Planning.

Evening Consultation Hours.

Dr. N. F. Benjamin moved a motion stating that the meeting was in favour of the abolition of evening hours

for all patients and expressing the opinion that the Common Form of Agreement should be revised to achieve this object. He said that medical practitioners would be able to give better service to their patients if they had a rest in the evenings.

Dr. J. R. Ryan seconded the motion. He said that many practitioners had given up evening consultation hours, but he thought that it would be better if an official pronouncement was made.

Dr. W. F. Simmons said that at Broken Hill no evening consultation hours were held and that in the Illawarra suburbs the consultation hour in the evening was from 5.30 to 6.30 o'clock p.m.

Dr. O. J. Ellis opposed the motion. He said that different conditions obtained in different parts of the State and that hours should be arranged to suit the varying conditions. Dr. R. J. Waddington also opposed the motion.

The motion was carried.

Compensation in the Event of Government Action.

The meeting resolved, on the motion of Dr. N. F. Benjamin, that a principle of compensation for goodwill, plant and private hospital should be stressed in the event of loss by government action.

Salaries in a Government Service.

The following motion moved by Dr. A. L. Castleberg was negatived:

That, while not advocating a salaried medical service, this Branch is of the opinion that, in the event of such a service being forced on the profession, no man at present in practice, or having been in practice, should be obliged to accept a smaller salary than the certified net income received by him at the time of inception of such a service, due allowance being made for the alteration of working conditions.

Vote of Thanks.

The meeting concluded with a vote of thanks to the President for presiding.

NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and have resumed or will resume civil practice as from the dates mentioned:

Dr. W. F. Burfitt, "Gowrie Gate", 115, Macleay Street, Potts Point, New South Wales (June 20, 1944).

Dr. A. S. Furness, 88, Russell Street, Toowoomba, Queensland (October 9, 1944).

National Emergency Measures.

NATIONAL SECURITY (MEDICAL CO-ORDINATION AND EQUIPMENT) REGULATIONS.

Penicillin Order.

THE following amendment to the Control of Penicillin Order has been promulgated in the *Commonwealth of Australia Gazette*, Number 189, of September 20, 1944.

In pursuance of the powers conferred on the Chairman, Central Medical Co-ordination Committee, by regulation 42 of the National Security (Medical Co-ordination and Equipment) Regulations, and delegated by him to me by instrument of delegation dated the fourth day of October, 1943, issued under regulation 20 of those Regulations, I, Hibbert Alan Stephen Newton, Chairman of the Medical Equipment Control Committee, acting upon the recommendation of the Medical Equipment Control Committee, hereby make the following Order:

Citation.

1. This Order may be cited as the Penicillin Order.

Revocation.

2. The Control of Penicillin Order is hereby revoked.

Supply of Penicillin.

- 3.—(1.) Subject to paragraphs 5 and 6 of this Order, a person shall not supply penicillin to any other person for the treatment of any member of the civil population, except

upon production of a written certificate in the form set out in the Schedule to this Order addressed to the Senior Commonwealth Medical Officer in the State or Territory concerned, signed by a legally qualified medical practitioner, and containing a statement that the patient is suffering from one or other of the following diseases:

Septicæmia or pyæmia (excluding infective endocarditis),
Meningitis,
Cerebral abscess,
Primary blood borne osteomyelitis,
Pneumonia,
Cavernous sinus thrombosis,
Gas gangrene, or
Tetanus,

and, if the disease has been verified by bacteriological examination, a statement to this effect including the bacteriological diagnosis.

Use of Penicillin.

4. Penicillin shall not be used by any person for the treatment of any member of the civil population except for the treatment of a disease caused by one or more of the following organisms:

Neisseria gonorrhæe,
Neisseria meningitidis,
Staphylococcus aureus,
Streptococcus pyogenes,
Bacillus anthracis,
Actinomyces dovis (hominis),
Clostridium tetani,
Clostridium welchii,
Clostridium septicum,
Clostridium oedematiens,
Corynebacterium diphtheriæ,
Streptococcus viridans,
Pneumococcus,
Anaerobic streptococcus, or
Treponema pallidum.

Power of Senior Commonwealth Medical Officer or His Deputy to Waive Certain Requirements.

5. The Senior Commonwealth Medical Officer in any State or Territory or his deputy may, in any particular case in which, in his opinion, it is desirable to take such action, waive any of the requirements set out in paragraph 3 of this Order.

Power of the Director-General of Health to make Penicillin Available for Experimental Purposes.

6. Nothing in this Order shall prevent the Director-General of Health of the Commonwealth making penicillin available for experimental purposes.

THE SCHEDULE.

Form of Certificate for the Supply of Penicillin.

To the Senior Commonwealth Medical Officer, State of I, the undersigned medical practitioner, hereby certify that the particulars set out hereunder in regard to the patient named herein are, to the best of my knowledge and belief, true and correct.

Name of patient:

Age:

Address:

Disease from which patient is suffering:

Quantity of penicillin to be supplied:

Where treated (at home, hospital, etc.):

Date of injury or onset of illness:

Clinical history (essential details only of previous treatment, operative and therapeutic):

Results of bacteriological investigation and other laboratory findings:

Essential details of treatment and current clinical history:

Result:

(Signature)

Name and address (in block letters).

Dated this eighteenth day of September, 1944.

ALAN NEWTON,
Chairman, Medical Equipment Control
Committee, acting as delegate of the
Chairman, Central Medical Co-ordination
Committee.

EXPLANATORY STATEMENT.

The Commonwealth Director-General of Health, Dr. J. H. L. Cumpston, has forwarded the following statement for publication:

It will be seen that in paragraph 3, subsection (1), it is now only necessary that the certificate submitted to the Senior Commonwealth Medical Officer shall be signed by one legally qualified medical practitioner, and that verification of the disease by bacteriological examination is not an absolute condition to the supply of penicillin.

It is very important, however, that laboratory diagnosis should be made whenever possible even if this is put in hand simultaneously with the application for penicillin. While it is desired to avoid delay in the use of penicillin in cases where its immediate use is desirable, it is equally necessary to avoid its continued use in cases in which there is no prospect of any benefit resulting from its use.

Paragraph 3, subsection (2), which required that the certificate should state that sulphonamide therapy has failed in the treatment of pneumonia, has now been deleted so that penicillin can now be used for any case of pneumonia whether treated by sulphonamides or not.

Paragraph 5 has given wider powers to the Senior Commonwealth Medical Officers in that they may sanction the supply of penicillin in certain cases without obtaining a certificate signed by a legally qualified medical practitioner. (This latter amendment will allow, for instance, the supply of small quantities of penicillin to dentists for use in the treatment of acute bone infections of the jaw.)

These amendments to the Penicillin Order have been made owing to the advance that has been made by the Commonwealth Serum Laboratories in production during the past few weeks.

Although the supplies are still considerably short of the ultimate target of production proposed, it is, nevertheless, considered that the use of penicillin can be gradually extended to persons other than life and death cases as was necessary when the first very limited supplies were released for civilian use.

Special attention is called to the greater availability of penicillin which will allow its use for early administration in all pneumonia cases and in some other classes of cases without waiting for evidence that sulphonamides are ineffective.

With regard to infected bone conditions, it has been found that the early treatment of these with penicillin will very often eliminate the use of surgical measures, by preventing abscess formation.

A decision in each case will be given by the Senior Commonwealth Medical Officer, and practitioners are advised to make application early in the case with full supporting details.

Nominations and Elections.

THE following have applied for election as members of the New South Wales Branch of the British Medical Association:

Dobell-Brown, Stephen William, M.B., B.S., 1938 (Univ. Sydney), 4, Tivoli Avenue, Rose Bay.

Duncan, George Craig, M.B., B.S., 1943 (Univ. Sydney), 70, Australian Camp Hospital, Greta.

Kent, Pauline Ashenden, M.B., B.S., 1944 (Univ. Sydney), Base Hospital, Wagga Wagga.

Scanlan, Frederick Joseph, M.B., B.S., 1944 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.

Diment, Edward Maxwell, M.B., B.S., 1944 (Univ. Sydney), c/o. Wollongong Hospital, Crown Street, Wollongong.

Obituary.

PHILIP THORNTON THANE.

WE regret to announce the death of Dr. Philip Thornton Thane, which occurred on September 21, 1944, at Double Bay, New South Wales.

Naval, Military and Air Force.

CASUALTIES.

ACCORDING to the casualty list received on September 20, 1944, Major R. H. Formby, A.A.M.C., who had been placed on the "dangerously ill" list, is now reported to have been removed from all lists.

Diary for the Month.

- OCT. 3.—New South Wales Branch, B.M.A.: Council Quarterly.
- OCT. 4.—Western Australian Branch, B.M.A.: Council Meeting.
- OCT. 4.—Victorian Branch, B.M.A.: Branch Meeting.
- OCT. 5.—South Australian Branch, B.M.A.: Council Meeting.
- OCT. 6.—Queensland Branch, B.M.A.: Branch Meeting.
- OCT. 6.—Victorian Branch, B.M.A.: Legislative Subcommittee.
- OCT. 10.—Tasmanian Branch, B.M.A.: Branch Meeting.
- OCT. 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- OCT. 10.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- OCT. 13.—Queensland Branch, B.M.A.: Council Meeting.
- OCT. 13.—Victorian Branch, B.M.A.: Ethics Subcommittee.
- OCT. 16.—Victorian Branch, B.M.A.: Hospital Subcommittee.
- OCT. 16.—Victorian Branch, B.M.A.: Finance Subcommittee.
- OCT. 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- OCT. 17.—Victorian Branch, B.M.A.: Organization Subcommittee.
- OCT. 18.—Western Australian Branch, B.M.A.: Branch Meeting.
- OCT. 19.—South Australian Branch, B.M.A.: Council Meeting.
- OCT. 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
- OCT. 19.—Victorian Branch, B.M.A.: Executive Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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